# THE AMERICAN ARCHITECT

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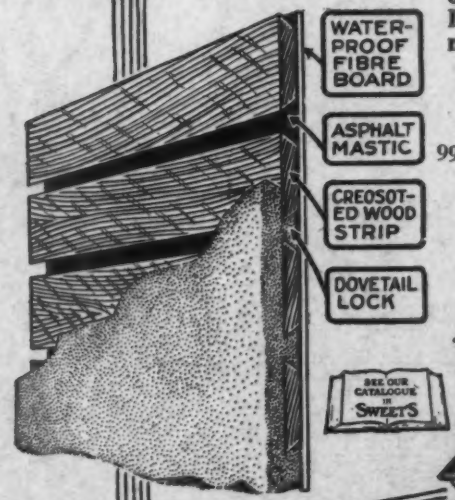

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ALTAR IN THE CATHEDRAL, GRANADA

THE AMERICAN ARCHITECT

VOL. CXVII WEDNESDAY, FEBRUARY 25, 1920 NUMBER 2305

# Some Advantages of Fixed-Fee Contract*

IS the general contractor to remain a constructive force in the building industry? We would hardly be attending this meeting were we not certain that the general contractor renders a needed service to the owner and architect and engineer. Certainty of delivery within the set time, reasonableness of the cost of construction, and the carrying out of plans and specifications without undue difficulty to owner or architect in getting that compliance, are dependent upon the existence of concerns such as are represented in the memberships of this association.

Yet there are certain individuals who see this matter differently, and who, noting certain things wrong, believe that the remedy is to be found in the elimination of the general contractor and the assumption of his duties by the architect. What are some of these difficulties and what is the true answer? A well-known Middle West architect recently stated one side of the question in a letter to an architectural paper. That letter is significant to the members of this association as outlining a definite effort being made to get work done without the general contractor. It started with the right premises. I do not feel, however, that we as an organization or as individuals can agree with the conclusions. Let me quote:

"Curiously enough, the architect has little or no direct dealings with the craftsman who executes his designs, and the worst of it is that the head contractor is placed in a position in relation to the architect which is the very opposite of what it should be to secure the ideal results for architecture.

"Our system of letting work by competitive bidding and then placing the contractor in a position where his profit depends largely on doing as little as the contract will allow for the final execution of the work is a vicious system which has always resulted in making impossible that sympathetic cooperation between architect, master builder and craftsman, which must exist in order to secure the best results in the work."

I think little explanation of this statement is necessary. We all know it to be true. It is a clear portrayal of the situation under the Lump-Sum Contract. Regardless of the builder's ability, the amount remaining for profit is little or much, precisely according as the builder is fair or unfair, generous or tight in his interpretation of specifications.

But what is the answer? The author quoted has one idea and we have another. This architect goes on to say:

"An architectural firm with an architect at the head, a master builder and all of his assistants, including a competent force of skilled craftsmen to carry out sympathetically all of the details of the work, would make an organization which it must be admitted would undoubtedly be far superior in every way to the organization it is at present necessary to gather together for every architectural problem undertaken."

I submit that the Fixed-Fee Contract is a better solution of the problem. It requires that a reasonable fee be paid for a definite service.

SOME architects may handle their clients' work through letting all operations to subcontractors and may accomplish a good result, but there is no inherent necessity for the architect to broaden his scope. If he desires to increase his opportunity of making profit by extending his activities into the construction field it is unquestionably permissible, but to do so he must build a special construction organization able to do just what the general contractor now does, and, candidly, most architects would prefer not to be responsible for the larger organization with its certain heavy overhead. In our judgment, after forty years' experience with the various forms of building contracts, the Cost-Plus-Fixed-Fee Contract, when made with a builder of integrity and ability, brings all that a fair-minded owner can expect or want.

*A paper presented at the convention of the Associated General Contractors of America, at Chicago, Feb. 18, 1920.

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Ability to co-ordinate work is fundamental to economy. It is second nature to the general contractor. While men available to the general contractor are also available to the architectural firm, yet certain jobs going forward to-day where the architect handles all the work through subcontracts show very conclusively the lack of that co-ordination. A structure cannot be erected piecemeal, particularly in the case of concrete frame and floors. The continuance of identical operations over large areas is vital to economy. The synchronizing of subcontracts is equally important. If the orderly procession of work is not maintained someone is going to lose money or time or both. The subcontractor will not take that responsibility. The architect will do his best to co-ordinate all operations, but the owner holds the bag.

We have, then, merely a merging of architectural and construction activities under one head. That co-ordination may be entirely successful but it does not argue against the general contractor continuing to operate to the advantage of the majority of owners and also of architects who prefer to remain within their chosen field.

Co-ordination means economy, and is dependent upon the absolute dovetailing of all trades represented with each other and particularly with the main structural elements. The framework could be built at least cost if no cognizance were taken of other trades. If that work is let as a separate contract there will be little sympathy on the part of the builder with delays occasioned by or to other trades. Such delays will be the basis for "extras." The better way is to have the structural frame handled by the same organization responsible for the general co-ordination of all work. Therefore the architectural firm handling construction should do exactly what the general contractor now does. But, as a matter of fact, architectural firms do not except in rare cases, retain any part of the work for their own construction force to handle. Therefore such architect's service does not parallel the operations of the general contractor who does from 40 to 60 per cent of the work with his own organization and equipment.

But how will this contract meet our critic's objections? He wants the builder to operate with, instead of against, the architect. On the Lump-Sum basis there is a premium placed upon skinning the job and the multiplying of controverted interpretations of plans and specifications. Remove that premium and the difficulty disappears. The Fixed-Fee Contract does it.

THE "ideal result for architecture" consists in obtaining the best possible building at the lowest cost compatible with a reasonable time for execution. Now, the best possible building is not reasonably to be expected where the builder can increase his profit by the amount of every omission or undetected substitution. Nor will there be a fine execution of the work where every minor opportunity for betterment of plans and in fact every necessity for change from original layout offers opportunity for extras on which few contractors have ever been known to suffer a loss. Under the Fixed-Fee plan it is possible to order changes, great or small, with absolute knowledge that the cost will be fair and often without increasing the amount of the fee.

Unquestionably the Lump-Sum system has many faults. It often gives opportunity for arbitrary and unfair rulings against the contractor, in favor of the owner. It kills that sympathetic co-operation between architect, master builder, craftsmen and owner, which should exist if the owner is to secure the best results. To revive that co-operation we need only to adopt the Fixed-Fee principle.

May I quote from another well-known architect writing also in the architectural press and answering a question propounded to the membership of the Illinois Society of Architects. That question was: "Can construction costs be lowered?" We are all interested in its solution. Let me quote him briefly.

"On first reading I was inclined to say that it cannot be done . . . one method occurs to me. The idea I had concerns the letting of contracts. . . . There are two methods, first: Letting separate contracts for each branch of the work on a unit price basis. Second: letting a general contract for the entire work on the Cost-Plus-Percentage basis. The latter method is the one I suggest. . . ." Quoting further:

"The question is largely one of buying power The general contractor can buy and sublet so much cheaper than the architect that he saves not only his own percentage but in most cases considerably more. . . .

"The organized contractor's buying power is based on the same qualification as that of any business man who goes into the market to buy goods. He knows values and he knows the market. . . .

"There is still another advantage. The element of divided interest is eliminated. The relation of owner, contractor and architect becomes one of co-operation solely, each striving for the best results at minimum cost. . . ."

Thus we have heard from two architects. There is between them no middle ground. With the premises of the former we may agree, and with both the premises and conclusions of the latter we do agree.

Some of our members are strong partisans still of the Lump-Sum Contract and desire the Fixed-Fee Contract to be dropped. I believe, however, that under to-day's conditions the consensus of opinion of this organization, as well as of most owners, architects and engineers, is that the Fixed-Fee form of contract is wise and necessary.

The case might be different if we knew what carpenter labor would cost six weeks from to-day or whether cabinet work included in the contract will be delivered at an estimated figure or at a considerably increased cost, because of the almost impossibility of securing materials. Are contracts for certain materials worth the paper on which they are written? It is my understanding that certain of the smaller material manufacturers in one field have oversold their capacity several times and can deliver but a fraction of what they have contracted to deliver. Will they make good on their earlier low-priced orders or on their later high-priced contracts? What will we have to pay next summer when excuses take the place of shipments?

I believe these conditions are sufficient reason for the adoption of the Cost-Plus-Fixed-Fee Contract by builders; for its approval by architects and engineers and for its acceptance by owners who are fair enough to expect to pay what their buildings really cost under capable and trustworthy management. We can do our utmost to safeguard an owner against undue cost, but it is not our province to guarantee a cost unless we wish to enter into competition with Lloyd's. On the other hand, were the market falling, surely the owner would desire the advantage of possible lower costs.

THE Cost-Plus-Fixed-Fee Contract is just as adaptable to smaller-sized jobs as to the largest construction work, and the smaller contractors who are honest and capable can do work on this basis as readily as the larger contractors. The inefficient dishonest contractor, whether large or small, will be weeded out, and the standards of the building industry will inevitably be raised to much higher levels than would ever be possible under the Lump-Sum contract.

To me the vital necessity to-day is for this association to get behind the Cost-Plus-Fixed-Fee Contract for Building Construction. General contractors will not lose by its adoption; they have much to gain. Architects and engineers have much to gain. Owners have much to gain.

For neither the owner nor his architect and engineer desires the cheapest building it is possible for a builder to erect under the plans and specifications. But that is exactly what he gets under the Lump-Sum contract. There can be no such thing as complete specifications. A Lump-Sum Contract is a standing invitation to a builder to skimp the work just as far as he can get away with it.

Of course, a reliable contractor, jealous of his reputation, will not intentionally be unfair, and yet he is not able to look at a problem wholly from the standpoint of the owner if such an attitude jeopardizes his profit. Details not specifically covered in plans and specifications are frequently essential to the success of a building, and the builder is not able under a Lump-Sum Contract both to conserve his own interests and comply with the owner's wishes.

On the Fixed-Fee plan, however, his profit is determined when the contract is signed, and from that date he is seeking to erect the building speedily (so that he may release his organization to earn another fee), to erect it according to plans and specifications plus all later expressed wishes of architect and owner (in order that owner may again seek his service), and to erect it at the least cost compatible with the set standard of quality and speed in order that he may share in the savings.

Naturally, the architect has an interest in these things. His work need be only that of interpreter, and not of watch-dog.

Furthermore, the Fixed-Fee Contract permits work to proceed on the day the contract is signed. Construction may go on coincidentally with the development of details. If speed is paramount, the fixed-fee plan permits saving weeks and often months, required otherwise for completion of plans and specifications, quantity surveys, advertising for bids and final letting of contract. Under the Lump-Sum contract not one step can be taken until the contract is let on completed plans and specifications.

Occasionally a few dollars may be lost to an owner due to the later detailed plans necessitating changes in the preliminary construction, but this seldom occurs.

AN interesting comparison of results under the two methods of contracting has come to our attention. Last year two competing mercantile concerns decided at about the same time to enter a new territory, and service could only start after new warehouses were erected. Two reputable general contractors were engaged, one upon the lump-sum and the other upon the fixed-fee basis. The lump-sum job, almost identical in size with the other, was started first but is not yet in service. The fixed-fee job was completed and in use in December. Owners of the latter advised architect and builder of the imperative need for speed and the successful outcome was the result, not of greater contracting ability, but of co-operation, trust and confidence on one job and its lack on the

other, and the possibility under the Fixed-Fee Contract of beginning work on the signing of the contract, of excavating while foundation plans were being prepared, and of keeping the work throughout only one step behind the design.

But from the standpoint of the builder (a member of this association), what are the benefits except as we share the satisfaction of owner and architect?

Do we not render a definite service for which we should be paid? Is it not well that we know with some certainty what a given operation is to net us? Is it not legitimate that we put our profession upon a service basis comparable to that of the architect and engineer? Building contracting firms are notoriously short-lived and the fault is not, we believe, in the lack of business ability so much as the system.

But a more fundamental reason exists than those previously mentioned. I believe that the reason that this association should go on record as favoring the Fixed-Fee Contract is that it will eliminate from the field the dishonest builder. It will eliminate the organization which has not the ability to do successful work and that elimination will come about through the impossibility of that firm obtaining new business. Its record in the past will stand against it. Reputation is vital to a builder on fixed-fee operations. It is built up only through years of painstaking effort. It can be wrecked by a single operation. Therefore, dishonesty or lack of ability will promptly place a builder in such a position that he will be unable to stand investigation and therefore be unable to operate. There should be no room in the building field for other than able, conscientious builders.

To-day's practice with some builders operating under the fixed-fee plan is to refuse to make preliminary estimates in competition. If owner and architect have not enough confidence and trust to make a contract subject to the builder's making a satisfactory estimate of probable cost, then they prefer not to serve, believing that they can do their best where the fullest confidence is reposed in them.

I sincerely believe that in these times of high building costs we can, through the Fixed-Fee plan, turn out a building at the absolute minimum cost. Costs are high at best. Legitimate projects are being passed up daily due to the difficulty of figuring a profit on the use of structures at to-day's costs. Co-operation, identity of interest and early covering in rising markets, permitted through the Fixed-Fee contract will help toward cost reduction.

I can only submit as further proof that the Fixed-Fee plan is right, the fact that my concern's history of repeat business is a surprise even to ourselves and adequate proof to us that such a basis is logical, fair and in harmony with the times.

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SILENUS

SILK BATIK HANGING BY C. B. FALLS AND PIETER MYER

# Competition for a Stadium on the Lake Front, Chicago—Part II

Illustrating and Describing the Designs of
Zachary T. Davis and William F. Kramer and Coolidge & Hodgdon

*(The designs of Jarvis Hunt and Marshall & Fox, described in this issue, will be illustrated in issue of March 3)*

## Description Submitted with Design for a Stadium on the Lake Front, Chicago

*By* Zachary T. Davis and William F. Kramer, *Architects*

IN presenting herewith a design for the proposed stadium to be erected on the lake front and in accordance with the privilege granted in the program for the competition, the following is a résumé of the paramount features of the design, the value of the project to the community and the methods by which these are to be employed.

As the foundation of nationalism was founded in the Roman and Greek empires, by its emperors erecting monuments and stadiums of colossal magnitude and beauty to be used for the sole purpose of providing a suitable setting for that which brought the citizens together; so too, will the erection of this stadium provide for Chicago an adjunct toward establishing true Americanism, a sounder civic pride and international recognition as the builder of a municipal monument unsurpassed in modern times for utility, magnitude and beauty.

The uses of this structure are so extensive and varied that in this brief description only the pre-eminent ones may be enumerated.

The very name suggests a setting for the century-old Olympic games, and thus a provision for the exhibition and contest of every form of physical prowess and development among international participants.

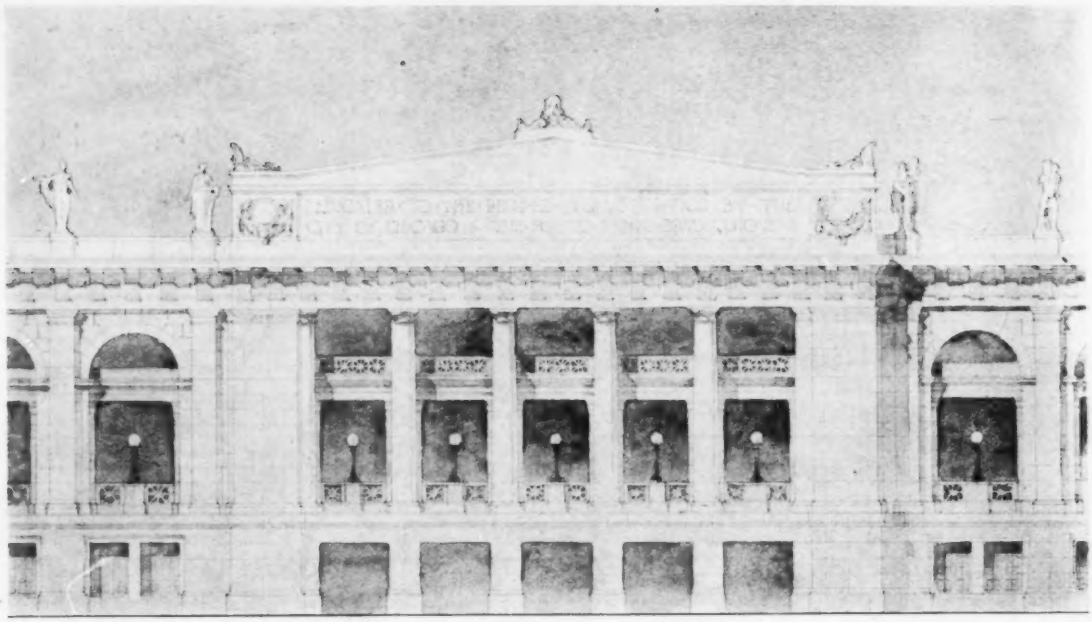
As, now, the eastern colleges look to the Yale Bowl as the most perfect place so far provided for athletics and exhibitions, so will the entire country look upon Chicago as the most probable setting of any great athletic meet. The metropolis of the West will serve the nation with its most adequately provided gathering place centrally located. It will necessarily be the center of national and state athletics, and thus a feature toward promoting a national rivalry in athletics and, by virtue of its magnitude, recognition of the benefits derived from athletic contests and the interests centered therein.

The State and municipality, however, will undoubtedly be served, as they rightly should be, to a greater extent than any other factor, for here every organization recognized may make their presentations. The school children of the city of Chicago can be brought together in one place, heretofore impossible, for drills, exhibitions, demonstrations and other features of the educational system. No matter how small or how vast the gathering it is amply provided for; whether it be a football game between representative colleges, a world's championship baseball game, a national tennis match or Marathon, a track meet, bicycle races, winter sports, including hockey, ice skating, tobogganing and races. There are space and provisions for all and the necessary prerequisites for their proper execution; also installations to provide for the comfort, convenience and safety of both contestants and audience.

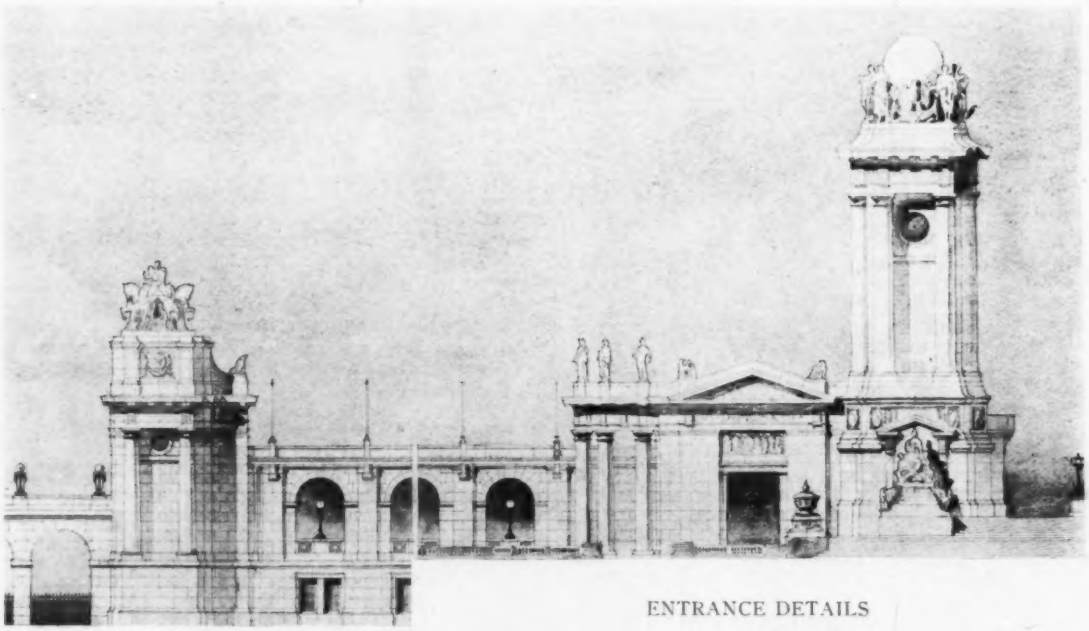
A more serious use, its services to the military and semi-military organizations. Here a brigade of any branch could be maneuvered, drilled or reviewed with perfect ease. An assembly point and a terminus for every parade, and if the numbers become so great they may circulate through, entering from one end and passing out at the other. Both men and animals can be conveniently and comfortably quartered beneath the structure. If an emergency arose a central armory might be established. The police and fire departments would naturally conduct their inspections and reviews within the arena, while drills and maneuvers could be the more efficiently conducted because of the control possible from any point.

A national or legal holiday hereafter need never pass unobserved for want of proper and sufficient provisions. The municipal Christmas tree will be available to all the people rather than the few that can be crowded into the streets of a city block. Each chronicled celebration, every festivity, as historical commemorations, patriotic demonstrations and works for charity, can be given with the ease and provisions for numbers that will necessarily mean success. Every organization of citizens, no matter of what character, whether it be civic, national, fraternal, religious, industrial or commercial, will find the stadium their acknowledged gathering place.

The stadium, if desired, may be created into a source of revenue because of its many utilitarian features. The circus would in truth be a circus, in the way they were presented to the Ancients, if given in this arena. Anticipating that oftentimes there will be paid admissions of various amounts, ample provision has been made properly to segregate the different priced sections, while the extensive use of ramps will necessarily prevent crowding and enable the large numbers of people to arrive and move easily and unhindered to any designated point. The entire ground floor and promenades are admirably suited to expositions of a nature where area is a prime requisite. Objects of great mass may be exhibited and cumbersome but mobile units may be moved about with ease. Again, the crowds that will necessarily congregate can be safely and comfortably handled, as the circulation about the entire structure permits easy ingress and exit. A stock show, which demands a large expanse of ground and numerous buildings, can be more efficiently and effectively



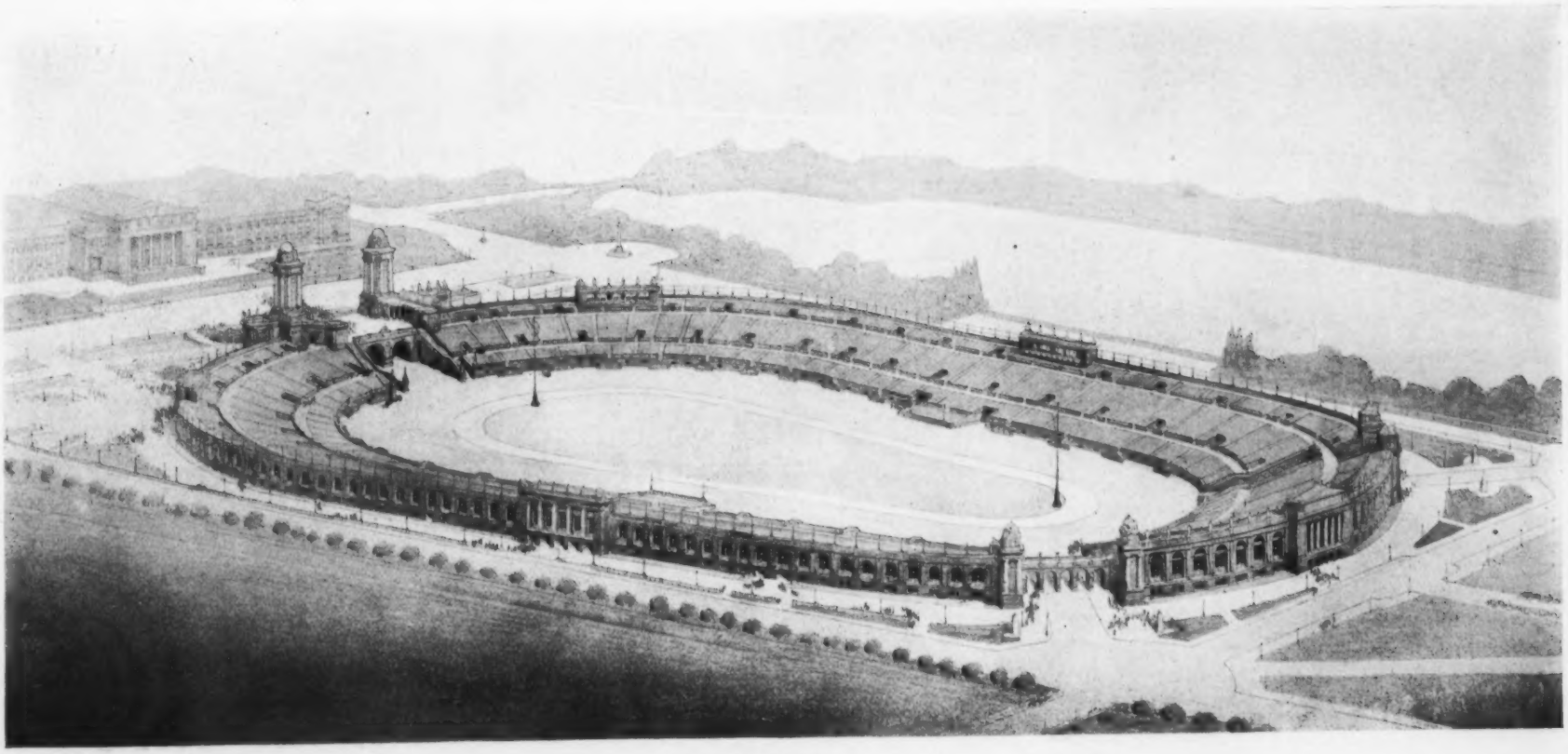
DETAIL OF SOUTH ELEVATION



ENTRANCE DETAILS

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

ZACHARY T. DAVIS & WILLIAM F. KRAMER, *ARCHITECTS*



PERSPECTIVE

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

ZACHARY T. DAVIS & WILLIAM F. KRAMER, *ARCHITECTS*

presented here than elsewhere, as the arena serves as the exhibition ground and the animals may be housed underneath the seats.

The open-air theater will provide an appropriate setting and a seating capacity for theatricals and spectacular productions on a scale perhaps not heretofore attempted for want of ample space and proper facilities. Band concerts to a larger and more comfortably seated audience and in a setting unexcelled, will prove most effective, while a Chatauqua could be conducted from the mammoth stage, the elements permitting.

There are features of construction which, though not self-evident on the drawings, are of sufficient importance to be worthy of special consideration and mention herein. In the author's conception it is planned that the structural parts or skeleton, seats, risers, ramps, stairways, floors and roofs shall be of poured reinforced concrete. The ornamental features and parts, such as cornices, columns, balustrades, statuary and the walls around the structural parts shall be of a cast concrete, waterproofed.

The method of construction anticipated is the column and girder. This method permits the circulation of air beneath the structure and seats which will prevent excessive absorption of heat by the concrete on hot days, permitting comfortable occupancy of seats.

Entrances and exits are ample and sight lines free for the 40,000 temporary seats to be placed in front of the structure, in the arena and on the concrete base at the rear. A feature of the construction is the fact that the concrete base for temporary seats at rear provides a brace for the walls and create an architectural elevation because of the increased height. The unnecessary expense of furnishing and erecting supports for the temporary seats at rear of structure was also considered by the author.

The arena for night-time use may be lighted to a daylight brilliancy by a battery of reflectors supported by four steel towers. It is proposed to illuminate the seats with portable standards provided with reflectors which will direct the light but one way, projecting it at the rear of the seats, consequently not into the eyes of the spectators. The exterior elevations are to be illuminated by a series of concealed reflectors projecting a flood light over the principal facades and pavilions. The substructure, accessories and exits to have a direct lighting system.

The author estimates the cubic contents of the structure above the top of foundations to be 8,400,000 cubic feet.

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# Description Submitted with Design for a Stadium on the Lake Front, Chicago

*By* Coolidge and Hodgdon, *Architects*

THE professional advisor states that: "It is the desire of the commissioners that the stadium be subordinated to the field museum. They wish the two to make a satisfactory composition taken together." The stadium is placed on the plot with the long axis turned to compose with the development of the area extending south of Sixteenth Street, which makes it possible to utilize the site to its entire advantage. Furthermore, if all the land is not used for the stadium it will not provide the 60,000 seats required by the program, which limits the base to grade 40, unless the conditions of the program are violated.

The permanent structure is not carried above grade 40, except the entrances and the wall, which serve as a protection for the temporary seats. At the north end the wall has been eliminated so the spectators will obtain an unobstructed view of the south entrance of the Field Museum.

The space allowed for temporary seating will easily accommodate 40,000 people. Two entrances at the northern end and one at the southern end are shown, which will permit a procession to come north on Michigan, turn into Twelfth Street and enter the arena by the northwest entrance, proceed along the westerly side, turn at the south end, going north along the easterly side out of the northeasterly entrance by the east end of the Field Museum, west on Twelfth Street to Michigan Boulevard and then north and this without any difficulty, giving the spectators an opportunity to see the procession at close range. Or a procession may enter at the south of the arena, maneuver in the arena and go out either one of the entrances at the north. There is a third entrance at the north end from the plaza south of the Field Museum on a level with the base of the stadium for people attending the theater. This is closed with iron gates. The audience may also enter the theater through the northeast and northwest entrances. The entrances for the spectators, for the general seating, are through archways in the outside wall, from the northwest entrance all the way around to the northeasterly entrance, the openings in the arch and the two northerly entrances are closed by iron gates.

The rooms under the seats in the section between the northwest and northeast entrances may be used for offices, dressing rooms and storage for the theatrical paraphernalia. A large number of rooms are shown throughout the structure for the storing of temporary seats, booths for concessions to sell refreshments, etc., for the stabling of animals, comfort stations, first-aid stations and so on.

The stadium is designed in such a way that no stairways are required, people reaching the seats by easy ramps. The two northerly entrances are designed so there is an easy slope in a total length of 450 feet of 24 feet from grade 7 to grade 31 to the plaza of the Field Museum, or about ½ inch to the foot. The plaza of the Field Museum is designed with a space at either end, one to provide for arrivals by trains and the other arrivals by water.

Sight lines have been worked out so that each seat has a direct line of vision over the whole arena.

The northwest entrance will be visible from Michigan Boulevard. Two reviewing stands with separate entrances are provided. Permanent roofs have not been shown over these as they would interfere with the line of vision of the spectators back of the stands, and it is the recommendation of this designer that these be more of a



THE AMERICAN ARCHITECT

PERSPECTIVE

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

COOLIDGE & HODGDON, *ARCHITECTS*

temporary nature and not made of masonry and iron.

The cubical contents of the stadium are 15,168,555 cubic feet.

*Material:* The best effect would be produced if the outside wall were built of marble like the Field Museum; the second choice would be limestone and the third concrete. The structure and seating to be reinforced concrete.

*Display of Bunting:* Generous provision has been made for flag staffs for banners, flags and streamers.

*Lighting:* Lamp posts have been provided for lighting the exterior wall and approaches.

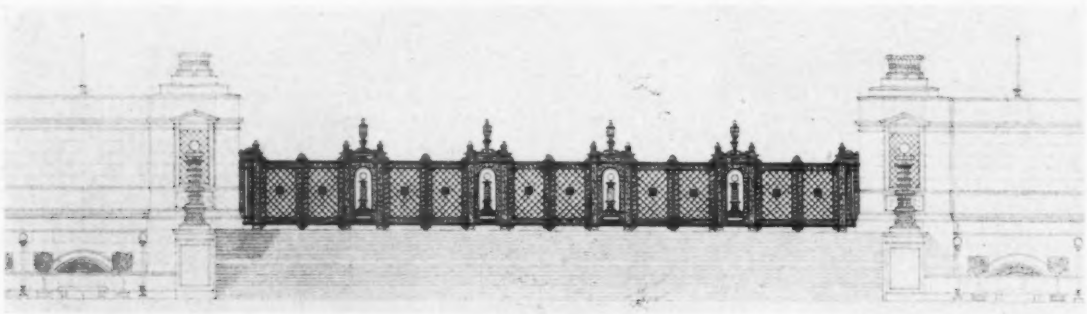
String courses and cornices to be lighted by rows of lamps.

Two masts are provided with spiral stairs to crows' nests, where searchlights and projectors can be operated to light the arena. From the masts cables may be run in all directions from which lamps will be suspended. It is believed this will furnish the best illumination.

It is also recommended that the roof over the deck be used for flood and spectacular lighting.

This competitor feels that instead of being detrimental to the general composition to have the stadium asymmetric to the Field Museum, it gives a more interesting layout and the assumption is not without classic precedent.

Mr. Penrose, in his Principles of Athenian Architecture, in discussing the Acropolis of Athens, states that: "It will be well to observe the remarkable absence of parallelism among the several buildings. The asymmetria is productive of a very great beauty, for it not only obviates the dry uniformity of too many parallel lines, but also produces exquisite varieties of light and shade.



DETAIL OF THEATER ENTRANCE
COOLIDGE & HODGDON, *ARCHITECTS*

# Description Submitted with Design for a Stadium on the Lake Front, Chicago

*By* Jarvis Hunt, *Architect*

. . . A similar want of parallelism in the separate parts is found to obtain in some of the finest mediæval structures, and may conduce in some degree to the beauty of the magnificent Piazza of St. Mark's at Venice."

The location of the stadium, the size of the arena, the number of permanent seats, the number of temporary seats, have all been fixed by you, and I have complied with all of your requirements.

In making this design we have taken into consideration the approaches to the stadium and the various elevations of streets around same, and have, therefore, chosen the east side as the principal architectural entrance to the stadium for the following reasons:

1. The level of the street on the east side (on the center axis east and west) is the same level as the principal gallery that feeds all of the arena.

2. The rear of the stadium must necessarily be the Illinois Central right-of-way.

3. This point is most easily reached from the north and south.

4. It seems most adaptable for so large a building, as it allows a proper design and capacity of the streets approaching same, and it is also possible to treat the water front architecturally in connection with and emphasizing the entrance.

5. This entrance forms a backing for the temporary seats (which temporary seats are nearest to the center of the arena), and also a setting for the open-air theater.

This treatment, with its broad surfaces, is most adaptable for commemorating wars or sports, as your committee may see fit to adopt.

The design seems to me to tie into and make a better foil for the existing Field Columbian Museum than would one of a colonnade treatment with more or less competitive proportions.

We have suggested on the block plan the means of bringing the street cars through a tunnel at Twelfth Street into a station below the level of the street south of the museum; also extending the same in a tunnel

(*Concluded on page* 250)

# EDITORIAL

*In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.*

## Forms of Construction Contracts

WILL a general adoption of a fixed fee form of contract eliminate the dishonest contractor? Will it put out of business every contractor who has not the ability successfully to accomplish the efficient and economical construction of a building? No less an authority than Mr. F. A. Wells, widely known as the head of a successful construction company, believes that it is the best and safest form of contract that can be devised and he so states in an address at the recent convention of the Associated General Contractors of America, printed in this issue.

It is undoubtedly true that, owing to present abnormal conditions under which construction is now carried forward, the fixed fee contract overcomes many of the present objections to other forms. It is now almost if not quite impossible for contractors to pre-determine the exact cost of a specific building. But, even in face of these facts, the question arises as to the advisability of the architectural profession giving unqualifiedly its approval to a form of contract designed to meet conditions as they now exist but which probably will continue for but a few years longer. There are undoubtedly many advantages contained in the lump-sum form of contract under certain conditions in normal times, but if a fixed fee form of contract becomes firmly established will not contractors combat its being discarded under any circumstances even when we have again returned to more stable conditions?

THE contention is made by Mr. Wells that speed of construction is one of the most important factors in modern building, and that a fixed fee contract contributes more largely to this end, and at the same time insures more economical and efficient construction than any other. While there is much merit in the contention, particularly at this time, there are many architects, whose years of relationship to construction work entitles their views as to the relative merits of the various forms of construction contracts to respectful consideration, who will not agree entirely with Mr. Wells. They will seek to direct attention to the fact that many important and costly structures have been erected on the now much assailed lump-sum contract system, and that the result has been satisfactory to the owner, the architect and the contractor.

The contractor urges that his is the most highly developed ability to co-ordinate work. Here again there may be room for debate. The co-ordination of work as practiced by every important firm of architects has so many times been effectively demonstrated as to require no further proof.

Volumes might be written as to the desirability of certain forms of construction contracts and these discussions may very properly be participated in by all those who are directly interested in building. But the fact remains and should be clearly kept to the front that the architect who is properly performing his function is in effect the master builder and that any form of contract that does not meet the approval of a large majority of the profession is not one that will best further professional ideals as to just what relation the architect assumes toward the building that is the result of his creative genius and which should therefore be under his immediate control from the preliminary sketch to the completed structure ready for occupancy. The form of contract that best secures this end will, after all, be the one that will eventually gain general acceptance.

In order that there may be obtained the widest expression of opinion on a subject of such great importance, the editors of THE AMERICAN ARCHITECT will greatly appreciate any further communications that they may print on this topic.

## Developing the Farm Building

TRAINERS of athletes always object to forms of exercise that only develop the body locally. They seek to build up first the entire body, later giving such attention to specific exercises as will increase efficiency in the direction desired.

In the development of a nation or even a municipality these same conditions obtain as to proper growth along proper lines. Possibly there is too close attention to the development of cities and not enough to our rural communities. And this lack of interest is beginning to have its effect on the rural communities and particularly the farming sections all over the country.

It has been found to be a grave mistake to infer that the farming population is not so thoughtful as are those who dwell in large communities. Recent inquiries by the government have disclosed that there is a decided feeling of unrest among the farmers. It has been proved that the farmer is now prepared to assert his right to recognition and not longer to be considered as a group outside of the real activities of our economic and political lives.

The farmer will demand recognition as a large producer and manufacturer and he will not much longer patiently allow others to gamble on and become wealthy in the things he produces. As he grows in importance, as he most certainly will, he will demand for himself and for his family the same opportunities for advancement as are to be availed of by his city-dwelling brethren. He will insist in the future that his house, his farm buildings and his social relations be fully up to every American standard, and knowing that these may only be attained with money, we may expect to feel the effects of a movement on the part of farmers toward securing for themselves a share of the profit realized on their product.

IT will not be wise further to ignore either the farmer or the dwellers in rural communities. The American Institute of Architects has been quick to endorse and at times enthusiastic in its co-operation with those large undertakings that affect the city. For now more than two years THE AMERICAN ARCHITECT has urged that some closer attention be paid to the farmhouse and its dependent buildings. Owing to the wideawake spirit of some of the middle Western delegates to the Nashville Convention, a resolution appointing a sub-committee on farm buildings was passed at that convention. Nothing, as far as we are able to learn, has come out of that committee.

Recently, announcement was extensively made of a proposed conference on farm buildings. The committee in charge, a large one, did not contain the name of a single architect. THE AMERICAN ARCHITECT directed attention to this omission and was at once assured that an architect would be added to the committee.

No credit may be taken by this journal for the performance of a simple act of duty, but it may be asked if the Institute or other organized bodies of architecture may not be considered as properly sharing the responsibility of conserving the rights of architects to recognition?

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## Bernard Shaw on Architecture

PROLIFIC writers, in courting the spot-light, find value for themselves principally in the ingenuity or originality of their treatment of well-worn topics. Take for example, Bernard Shaw. Mr. Shaw has now turned the activity of his eccentric genius to a discussion of architecture. He favors a new style for each generation and insists that every building should be knocked down when it has reached the age of twenty years. As far as the destruction of houses and of cathedrals are concerned, Mr. Shaw stoutly advances the opinion that one of the good things that comes out of the war is the destruction of such buildings and their rebuilding in a newer and later style. No one will take these things seriously. The Shavian tendency toward this sort of thing is too well known. But with these sensational ideas the question is usually raised whether or not there be in them a grain of good sense.

Creating a new style of architecture for each generation would certainly require the development of originality that has not up to the present time been displayed. In this, as urged by Mr. Shaw, we may find an admonition to avoid the slavish following of precedent and the laborious production of replicas, to set free our creative power and build that which dares comparison with everything which preceded it.

If the things that Mr. Shaw so stoutly urges could but happen and if he may live to see the results, he would undoubtedly seize that opportunity to condemn. A man who has written so much will not be able to remember even a few of the many visionary things he has urged. Possibly he doesn't want to remember and would have the course of architecture follow the methods of his mind.

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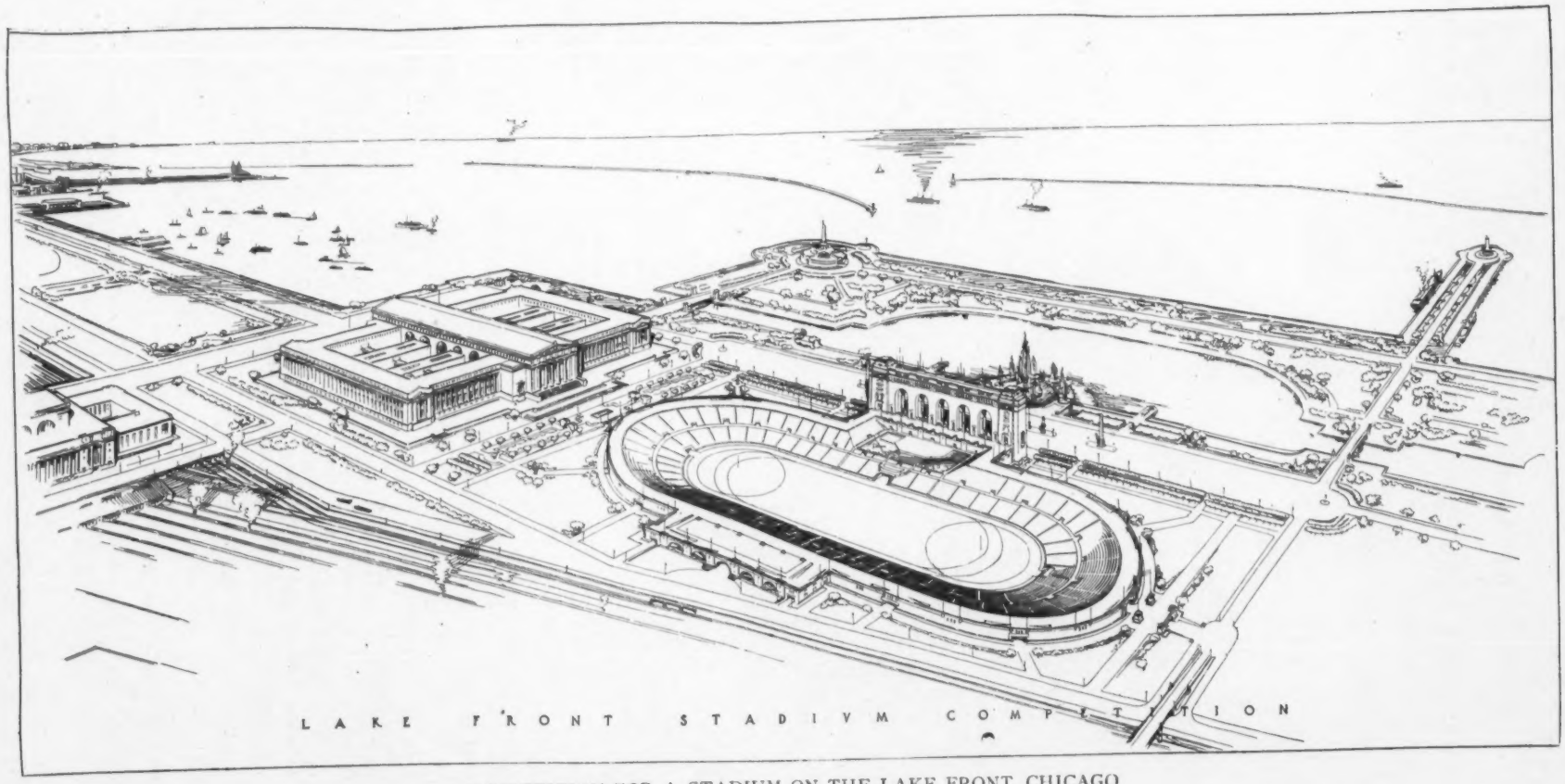



COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

JARVIS HUNT, *ARCHITECT*

## A Stadium on the Lake Front, Chicago

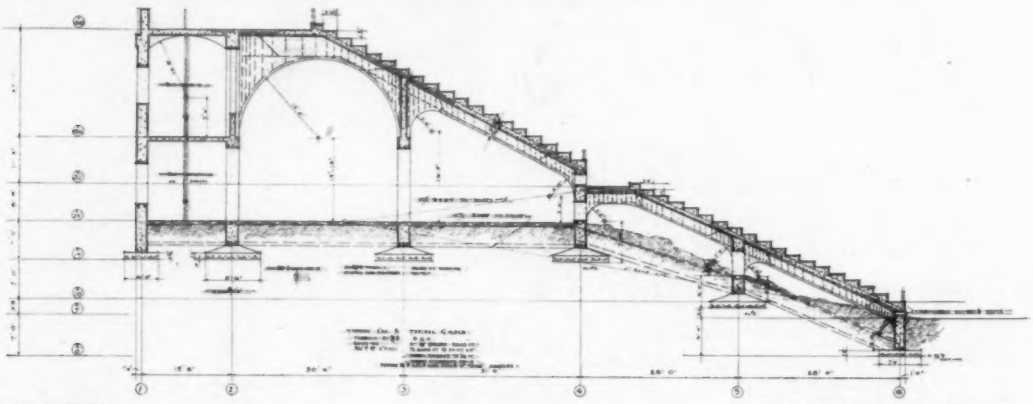
(*Continued from page 246*)

underneath the level of the street on the west side of the stadium. We have also connected it with the Illinois Central Railroad.

On the west side of the stadium are accommodations for housing the different circuses, horse shows or other pageants for which the stadium may be used. This structure also forms a base for the temporary seats that may be placed above it to correspond with the same temporary seats on the east side of the proposed structure.

The exits and inlets to the stadium for pageants or other large exhibits are so arranged that they do not come on the same level or interfere with the inlets or exits of the public viewing same.

Automobiles may be parked south of the stadium.



SECTION

JARVIS HUNT, *ARCHITECT*.

# Description Submitted with Design for a Stadium on the Lake Front, Chicago

*By* Marshall and Fox, *Architects*

We herewith submit competitive sketches for the construction of the stadium on the lake front, Chicago.

In preparing a solution of this problem presented by the provisions of the program of the owner that would give adequate interpretation to the owner's highest purpose, it has been our consistent practice to employ a breadth of vision that lifts the whole from materialistic restrictions and places it in its proper significant position: that of a prototype for suitable accommodations in which the citizens of any such great municipality may further their health and happiness and express their national and civic emotions.

Further, it is, we believe, clearly recognized by the owners, in providing this stadium for the lake front, Chicago, to be their obvious duty to make the best possible provision for the health and happiness in leisure of the masses—in short, to provide for the needs of a new world, a new world which the gallant sacrifice of American manhood in the World War has alone made so early possible. It would be unworthy of such a great municipality, in lifting to a higher plane of living the masses of its citizens, to disregard one of the great factors of the uplift. Therefore we provide that this stadium be in a measure a monument commemorative to the American soldiers of the World War. Both this tribute to the past and vision of the future have been suitably expressed in the magnitude of our conception of the whole; in the sub'imity of the design, and by the excellence of the plan which leads to the utmost practicability in the stadium's use.

Our preliminary sketches provide for a careful adherence to the requirements of the program of the owner, such as:

1. An arena arranged, per provisions of the program of the owner, for athletic meets, ice carnivals, tobogganing, skiing, fairs, horse shows, military maneuvers, pageants, etc.

2. A theater at one end of the arena with a maximum seating capacity of 9500, providing for concerts, outdoor dramatics, etc.

3. Permanent seating capacity of 60,000, with an additional temporary seating capacity of 40,000, 20,000 of which are placed on the third and top promenade extending around the entire stadium, and 20,000 in temporary seats below the permanent seats, these temporary seats extending into the arena.

4. Reviewing stand which is sufficiently elevated to command the necessary view of the arena, with adequate treatment of seats in carving, etc.

5. The cubic contents of the entire structure is 21,750,000 cubic feet.

6. Construction of reinforced concrete, with all engineering problems reduced to a minimum to eliminate unnecessary expense, that entire stadium may be suitably finished in Buff Bedford ashlar masonry.

7. Adequate provision for storing of temporary seats, stabling, and other storage, baths and locker rooms for athletic contestants, etc.

In addition, we wish to call your attention to the following:

First—Means of ingress and egress provide that the entire stadium, seating approximately 100,000 persons, may be vacated in a period of from three to five minutes. The series of arched entrances around the entire Stadium with ramps provide for this most fundamental requisite for the successful use of the stadium, thereby reducing to a minimum

(a) The possibility of loss of life by panic, exposure from sudden changes in weather, etc.

(b) The time and strength consumed by the citizen in approaching and leaving his recreation. His easy access to the stadium is further facilitated by the open plaza about the entire stadium, which eliminates congestion.

Second—Thus having entered the stadium with the minimum expenditure of time and effort at the arch whose number corresponds to the number on his seat, the citizen may in the least expensive seat enjoy a perfection in sight line equal to that of the most expensive seat. After an exhaustive study of amphiteaters and open-air theaters, both ancient and modern, we have for this stadium established the minimum angle permissible for the insurance of perfect sight lines. This, too, is a none the less fundamental requisite for the use of the stadium.

Third—Further, the citizen may during any intermission in performances, or as shelter during inclement weather, enjoy in the covered promenade about the whole stadium, located half-way up the banks of seats, public comfort stations, restaurants and emergency hospital. Off this promenade the administrative offices will be located.

Fourth—In the substructure various separate pools and gymnasiums for men and women, in connection with their separate club rooms, should be provided.

We have made these competitive sketches for a stadium for the lake front of Chicago, employing consistently the vision of a fitting tribute to the past and a pledge to the city's future—an embodiment of both—that will be a means to promote in the most uplifting manner the health and happiness in leisure of the citizens of Chicago.

## Discovery of Brumidi Paintings

An extraordinary art discovery has just been made in Washington when two large boxes, containing twenty-seven oil paintings by an eminent Capitol artist, the late Constantino Brumidi, were found after having been lost for thirty years. The discovery was made quite by accident, when Edward P. Schwartz, executor under Brumidi's will of 1879, after endless searching among all the warehouses of the city, remarked to his friend the banker, J. M. Boteler, of the National Savings and Trust Company, Washington, D. C., "I wish I could locate those Brumidi boxes." And Mr. Boteler answered, "Thank heaven, the mystery is going to be solved at last. Those two big boxes have been in our vaults for the last thirty years, and have accumulated storage charges of almost $300!"

In the presence of Dr. William H. Holmes, head of the National Gallery of Art, J. G. Langdon, landscape architect and city planner, in charge of the development of Washington's park system; Charles E. Fairman, custodian of the works of art at the Capitol, and others, the boxes were opened and the contents found in perfect condition, just as Brumidi himself had packed them away, when he willed them to his son years ago.

About thirty pictures were included, many of them undoubtedly the original studies of paintings later placed in various parts of the Capitol. Besides portraits of the artist's beautiful American wife, a painting of George Washington, evidently copied by Brumidi from the celebrated Gilbert Stuart painting, and one of Benjamin Franklin, after Benjamin West, there are others described as follows: "St. Patrick," "Child and Grapes," "The Reaper," "Adoration of the Wise Men," "Woman and Child," "The Five Senses," "Telegraph," "Robert Fulton." "Chariot," "Cupid Asleep," and "Madonna."

Brumidi was a striking figure in Washington years ago, and it is said that visitors from all over the world invariably asked at the Capitol where they could see Brumidi, sometimes waiting for hours to see the old painter hoisted or lowered in his wooden cage to and from his work in the dome, where he painted each day from 10.30 to 3 in the afternoon. A man of cultivated taste and wide reading, he was especially fond of the classic poets and thoroughly conversant with works of historical art. Shakespeare, Dante and the old Italian poets were his favorites. He died in 1880, leaving a will disposing of his works of art and other property, but it was impossible at the time to trace the boxes which have now just come to light. The final disposition of the pictures has not yet been decided, as they relate almost entirely to works at the Capitol.

## The Real Uses of Wood Alcohol

That the proposal of some radicals to stop the production of wood alcohol because of the deaths of scores who drank this alcohol by mistake is ridiculous and not to be considered seriously is the belief of the specialists at the New York State College of Forestry at Syracuse. The wood alcohol industry has no bearing whatever upon the prohibition laws, for wood alcohol is strictly an industrial product, while the potable liquor is the grain alcohol. Their resemblance in odor and chemical properties has brought about the fatal substitution of the poisonous wood alcohol by unscrupulous dealers.

The production of wood alcohol for industrial purposes is an important industry in New York state, a bulletin issued by the New York State College of Forestry in 1917 showing that 192,000 cords of wood annually are used in the destructive distillation of wood, to produce such products as tar, acetic acid, acetone and wood alcohol.

Wood alcohol is a most valuable industrial product, and is largely used in the production of formaldehyde, probably the best known antiseptic, but which is also used in the manufacture of dyes, particularly indigo, and in photography. Wood alcohol is also largely used in the manufacture of varnishes and lacquers, as well as for fuel. Wood alcohol is technically known as methyl alcohol, and is essentially poisonous, causing almost certain death when taken in quantities, and blindness, when used in smaller amounts, or in other ways than internally. Ethyl alcohol or grain alcohol is also used industrially, and forms the spirituous content of wines and liquors. It is usually denatured either with wood alcohol or other substances when used industrially and is then also toxic. Wood alcohol has a multitude of uses. The New York production of wood alcohol has run to nearly 2,000,000 gallons a year. The greatest single use is perhaps in the varnish industry, as a solvent. It was of enormous value in the production of high explosives.

# Revival of Egyptian Art Contemplated by Decorators

PHARAOH'S wallpaper and Belshazzar's linoleum may soon be as commonplace as real art may never be—part of the finishing touches in every average home as well as the basis of expensive decorations in the palaces of the rich. So writes Wm. A. McGarry in the Boston *Transript*. Designers who flock to their old sources of inspiration in Europe after the signing of the armistice, following four years of enforced staying at home, are coming back again to the art of seven thousand years ago in American museums, convinced that it offers far greater opportunity than the relatively modern art of Europe.

For a quarter of a century the directors of these museums and the archæologists employed by them have been dinning into the ears of artists and designers the inspirational value of Babylonian and Egyptian monuments, decorative panels and wall designs. But it was not until the war blocked easy access to Italy that they succeeded in getting an audience. Instructors in applied design have been of considerable help to the movement by constant iteration of the charge that the average American wall and floor covering design is hideous.

Miss Violet Oakley, known nationally both as a painter of portraits and of decorative panels, was one of the first to respond to the appeal of the museums. She made many sketches in the halls of the University of Pennsylvania Museum for the later of her mural decorations for the Pennsylvania State Capitol at Harrisburg. Encouraged by this example, a few of the large wall and floor covering manufacturers sent their designers on experimental trips to the museum in 1915. Since that time the habit has grown.

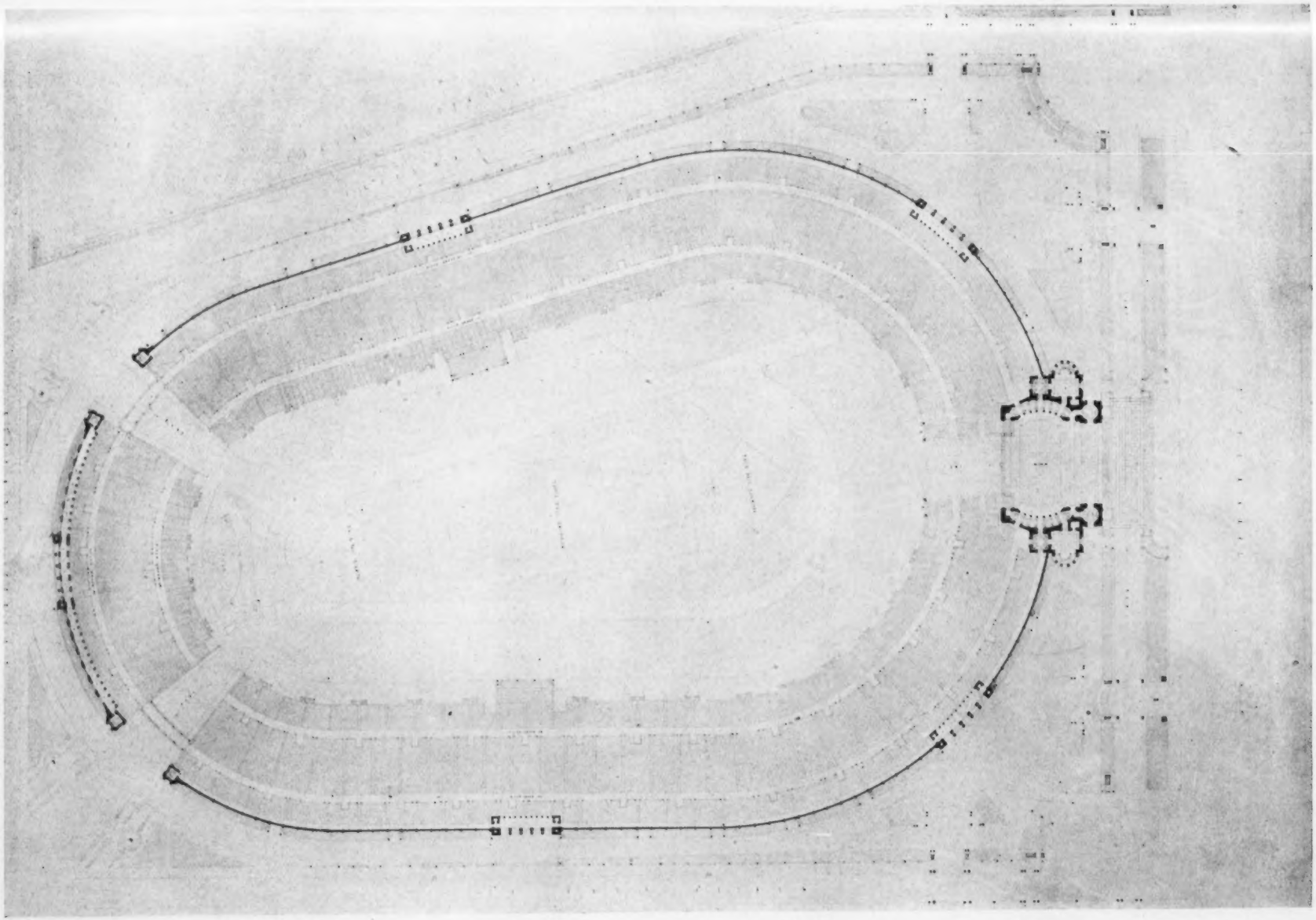
Until recently, however, the use of ancient models was looked upon merely as a temporary expedient. Now, according to the museum authorities, the designers have had opportunity to compare their work of the last four years with earlier productions, and they are coming back to Babylon. China, also, is coming in for her share of recognition, particularly in rugs. Within the past six months nearly every large manufacturer has started the production of Chinese rugs, the patterns for which in many instances are copies or developments of designs on ancient examples from the Flowery Kingdom. This art is older in some respects than that of Greece. It was at its zenith when Europe was going through the Dark Ages, when China was the cultural center of the world. Authorities of the museum have taken advantage of this trend to utter an appeal for a revival of the classic in decoration. And right in line with this appeal is an argument put forth by Dr. George Byron Gordon, director of the museum, concerning the essential identity of art and craftsmanship.

The sculptor, the painter and the story teller in their work and in their achievements share the same traditions as the mason, the goldsmith and the weaver, says Dr. Gordon. Whenever in the world's history this identification was an accepted fact, when a close association between art and craftsmanship marked the order of things, when the atelier was the workshop, when the artist and the craftsman were one, then great works were wrought and great names were handed down. Whenever an artificial distinction arose, art, entering a barren field, became the subject of affectation, and craftsmanship was debased. Such a distinction does not correspond with any reality of life. When artists attempt to set up among themselves an exclusive cult based on a belief in some form of special dispensation, it means that art is dead.

For the last six years or more the University Museum has been taking steps to inform those interested that its collections afford an unusual opportunity for guidance in the designing of modern manufactures. We have repeatedly pointed out, says the director, that the application of art as represented by traditional standards and historic precedents to fabrics of all kinds, to the products of the mills and the kilns of modern industry, is a lesson that has to be learned if this country is to hold its own even in a commercial sense in competition with the older civilization of Europe.

A staff of artists and instructors has been engaged to take charge of the general educational work for which the museum is equipped, and especially to help visitors, including the artisan, craftsman, designer, merchant or manufacturer, to translate the collections into terms applicable to the work of each. It is the business of these instructors to explain the design and workmanship that belonged to other times and places and to show how they may and ought to be adapted to modern American conditions and American ideals without in any way violating the essential fitness of things.

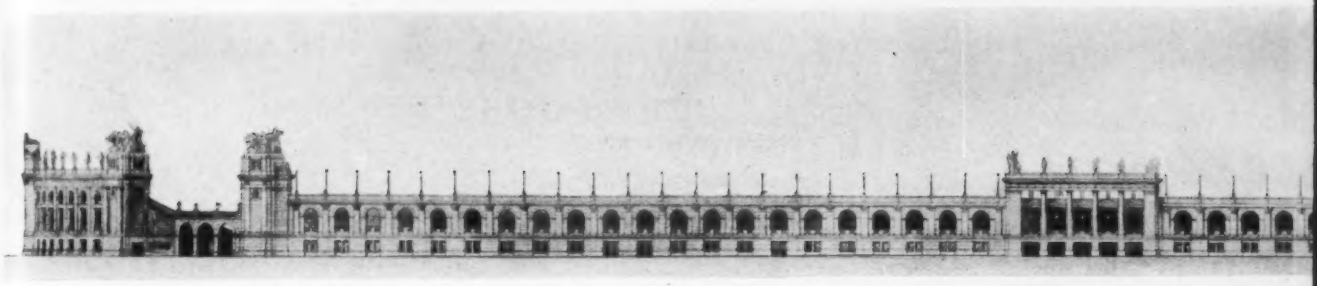
In the plan to open up more fully the resources of the museums to the craftsman, the artist, the



PLAN

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

ZACHARY T. DAVIS & WILLIAM F. KRAMER, *ARCHITECTS*



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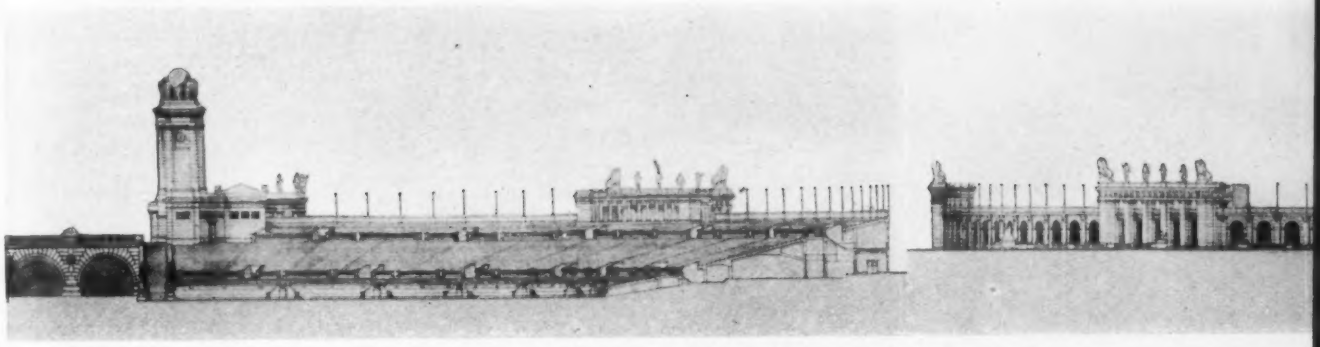
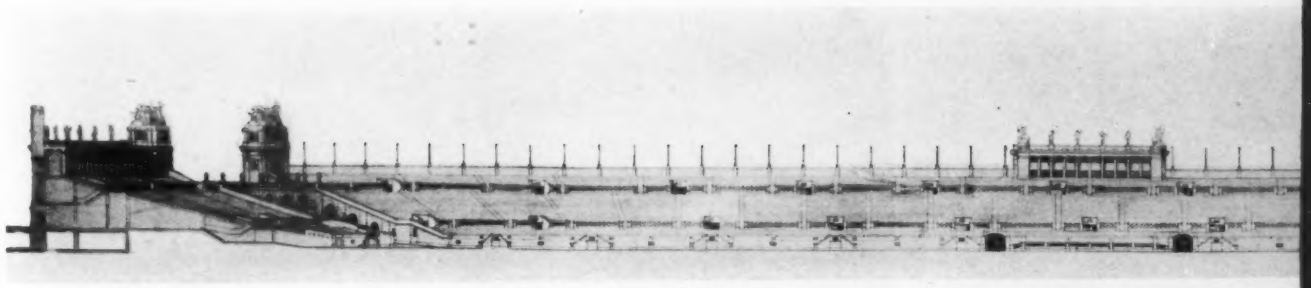


ONE-HALF TRANSVERSE SECTION LOOKING NORTH



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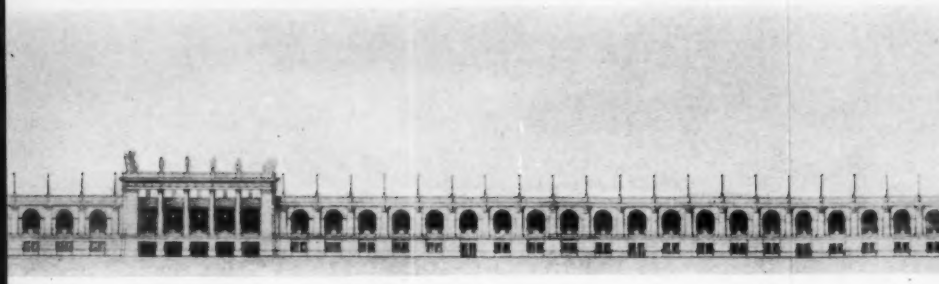

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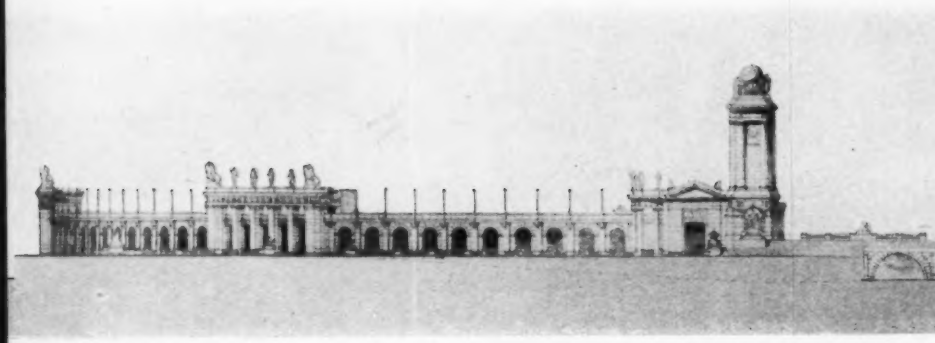

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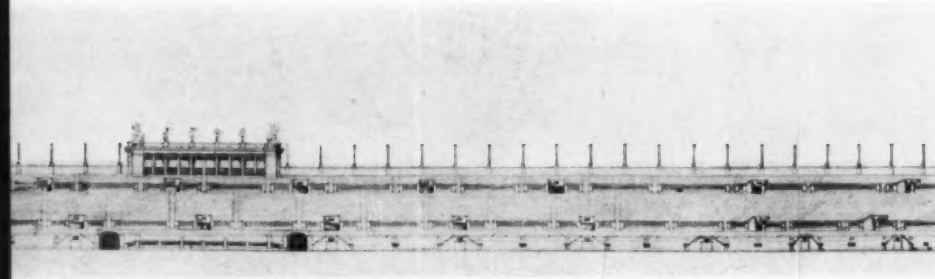
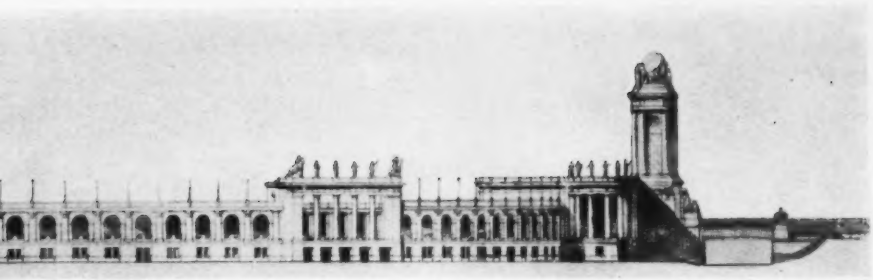
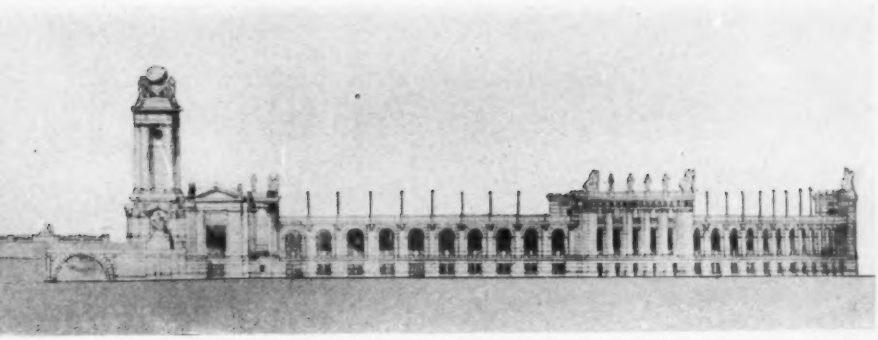


LONGITUDINAL SECTION LOOKING WEST

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

ZACHARY T. DAVIS & WILLIAM F. KRAMER, *ARCHITECTS*





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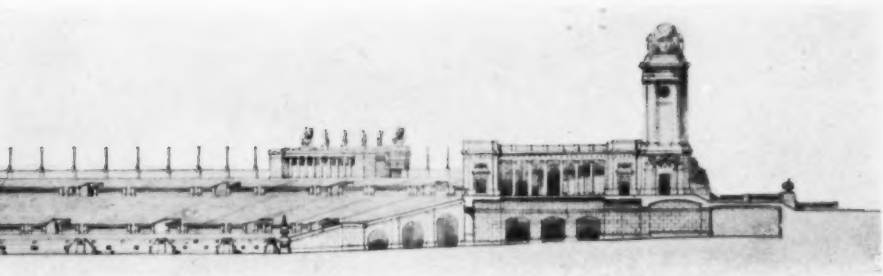
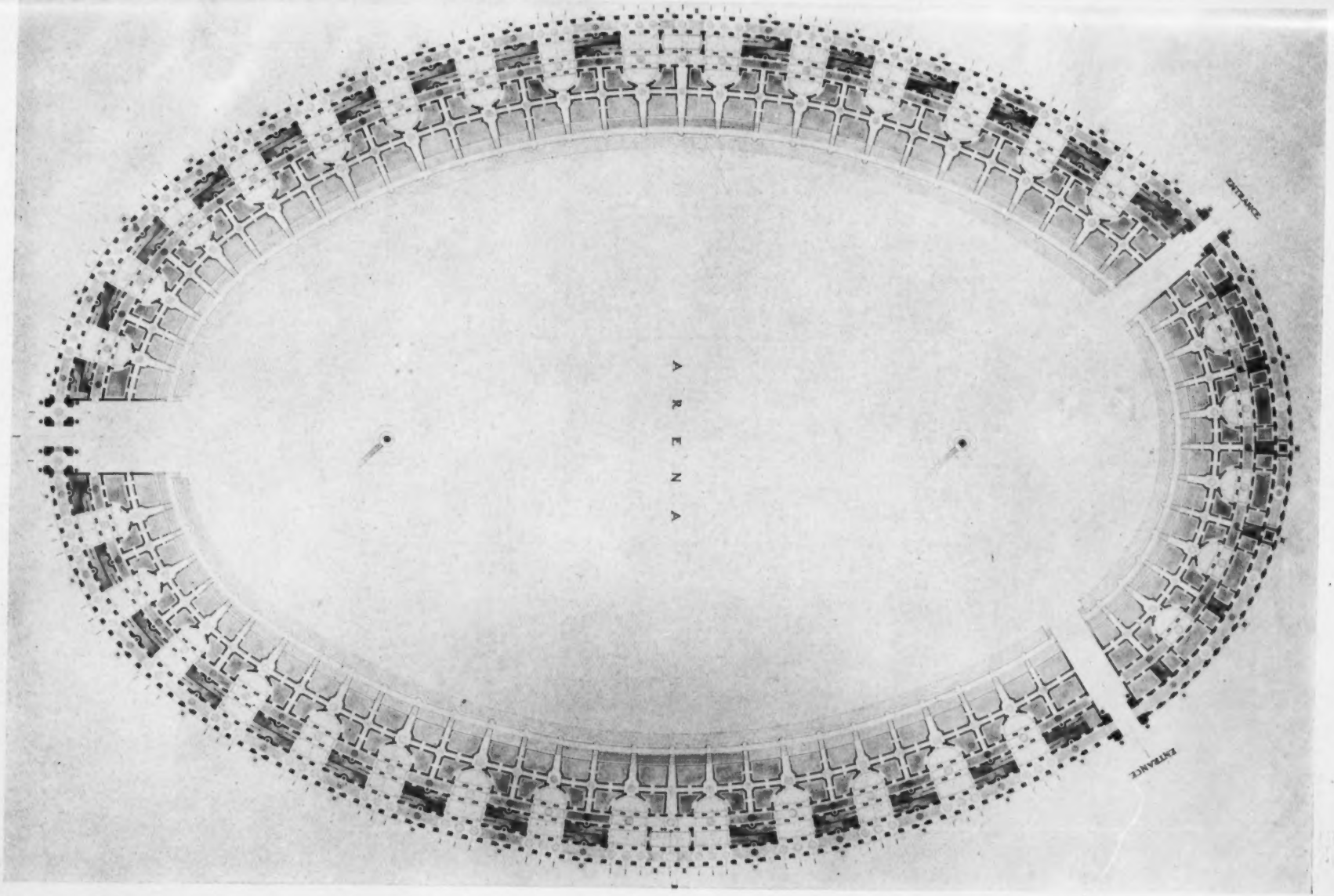


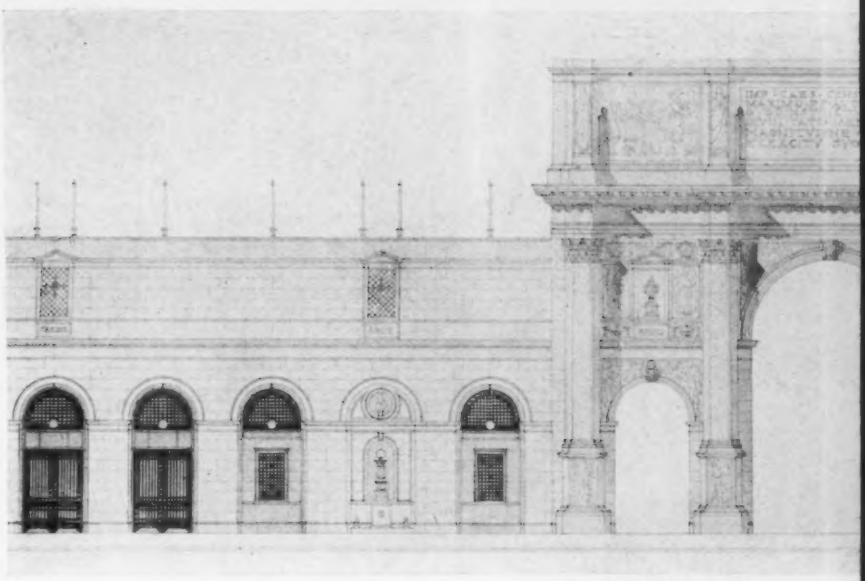


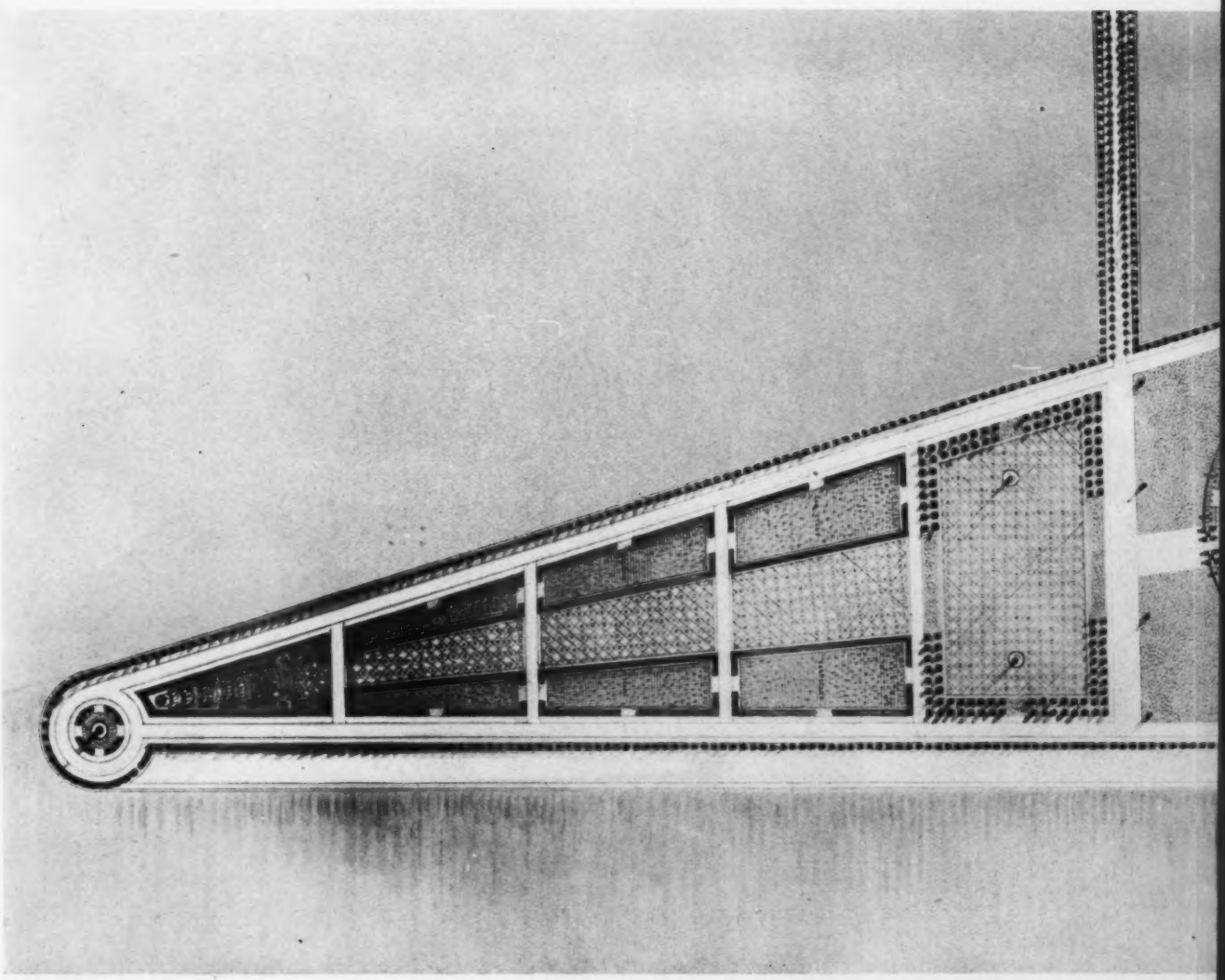

GROUND PLAN

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

COOLIDGE & HODGDON, *ARCHITECTS*

COMPETITION FOR A STADIUM
ON THE LAKE FRONT,
CHICAGO





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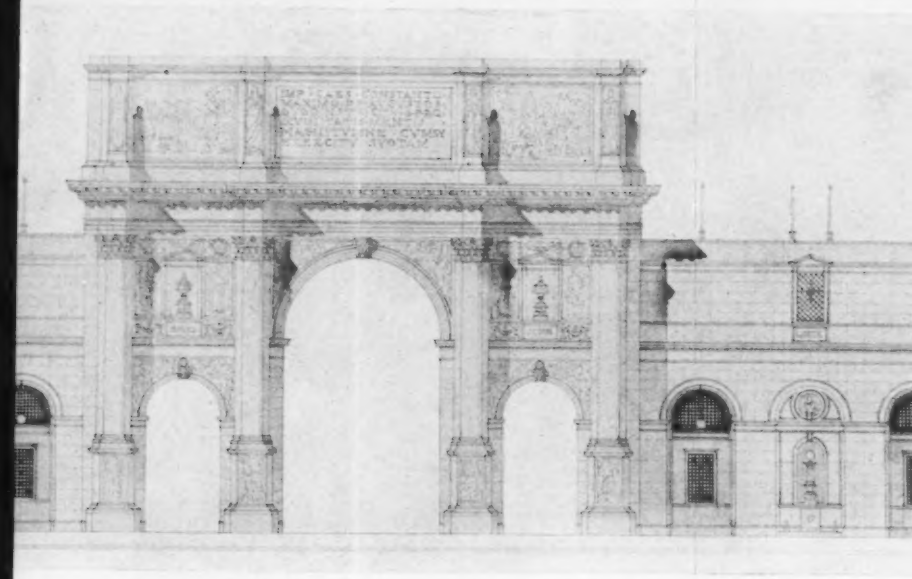

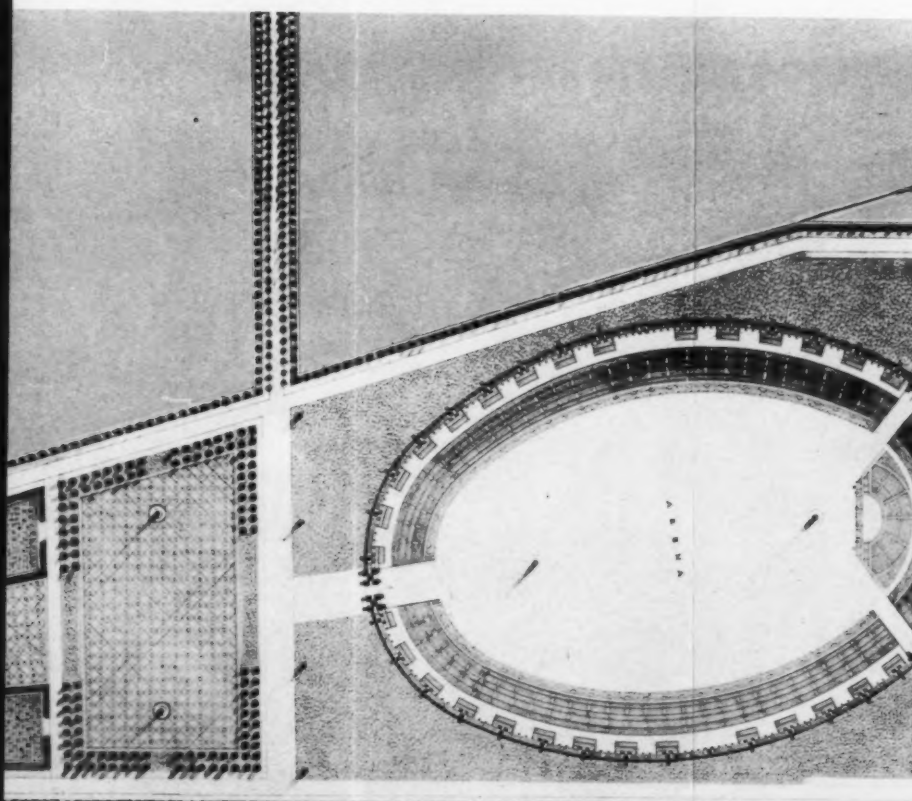

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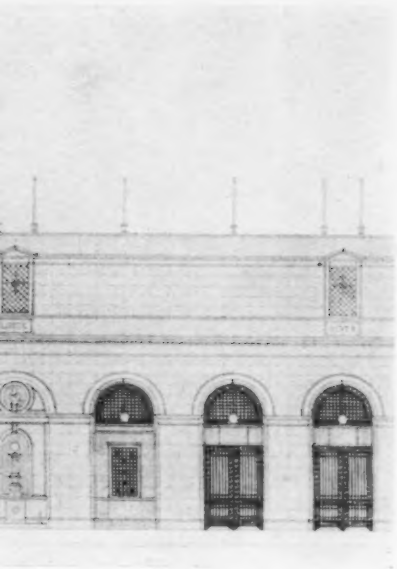
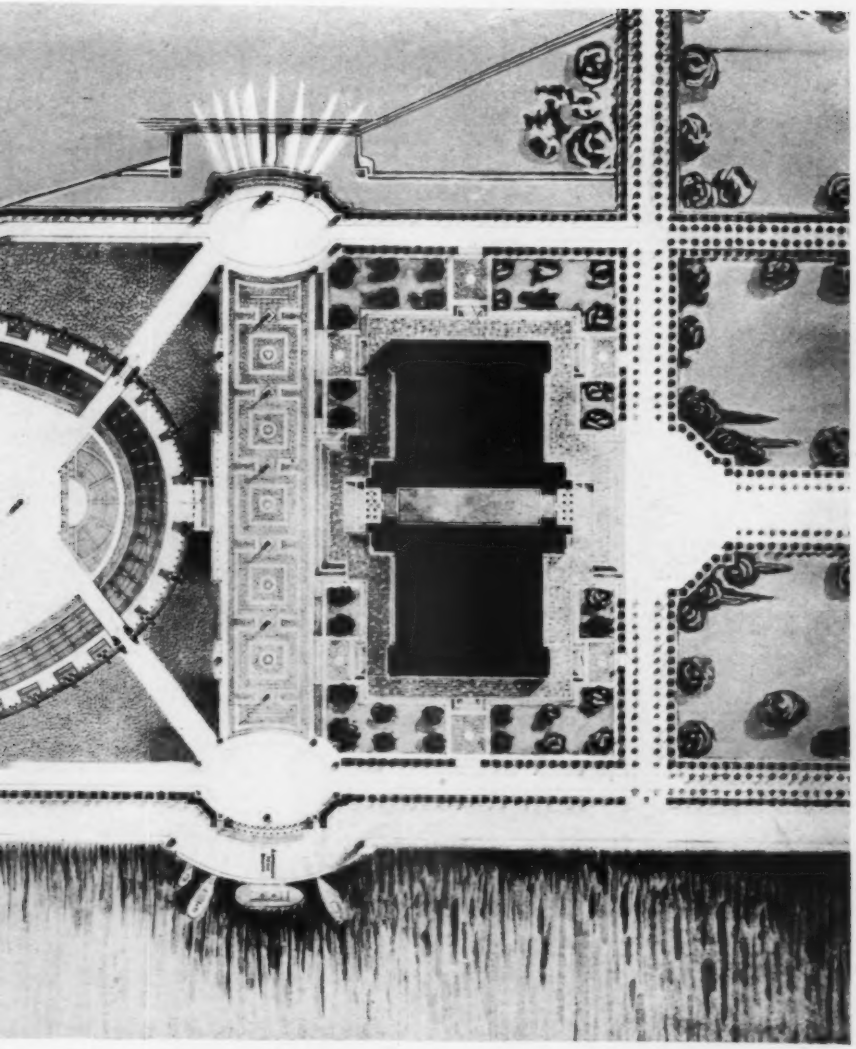
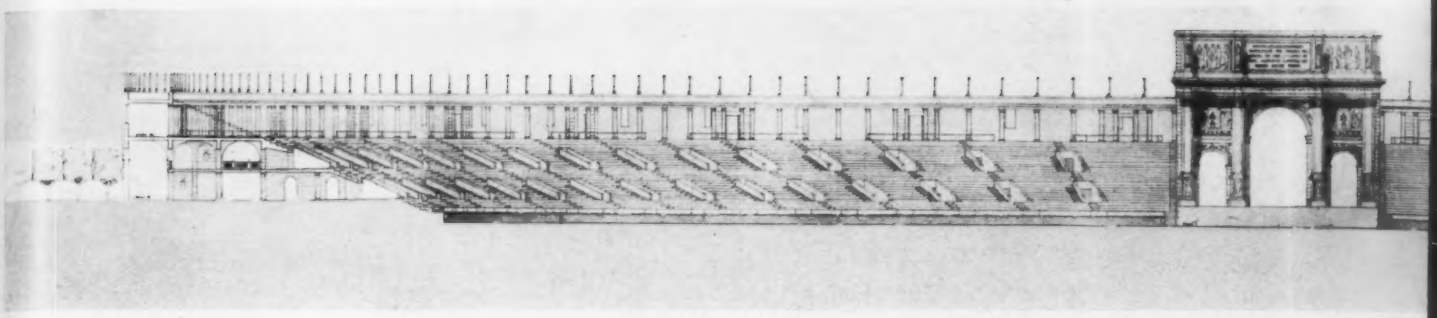


AT LEFT:
SOUTH ENTRANCE

BELOW:
PLOT PLAN·





TRANSVERSE SECTION LOOKING SO

COMPETITION FOR A STADIUM
ON THE LAKE FRONT,
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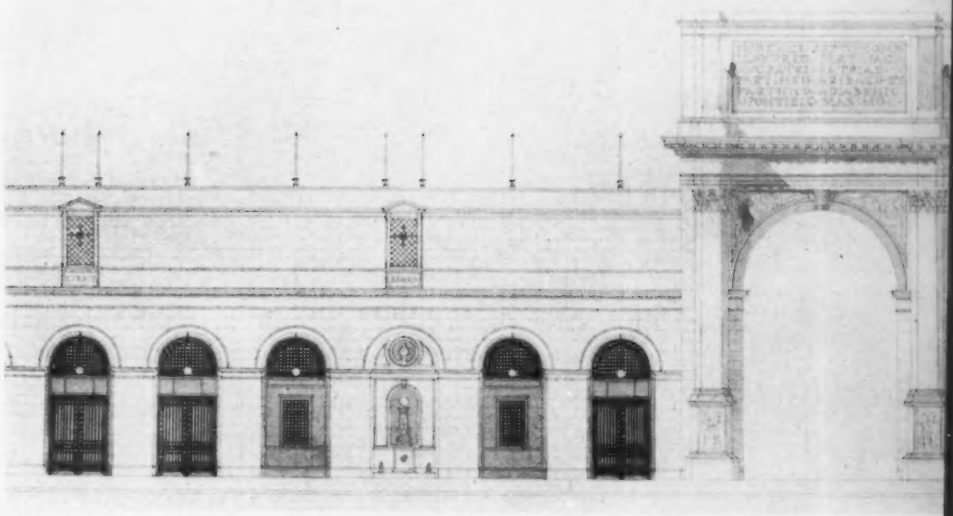
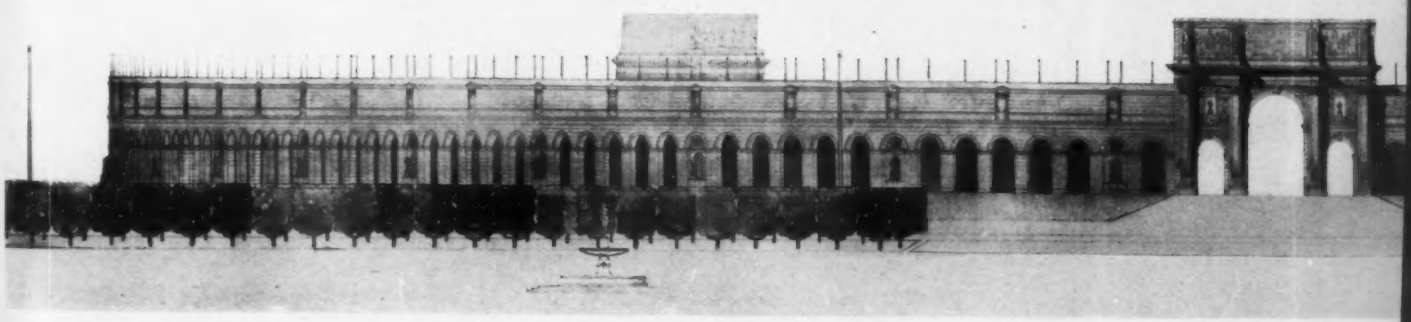
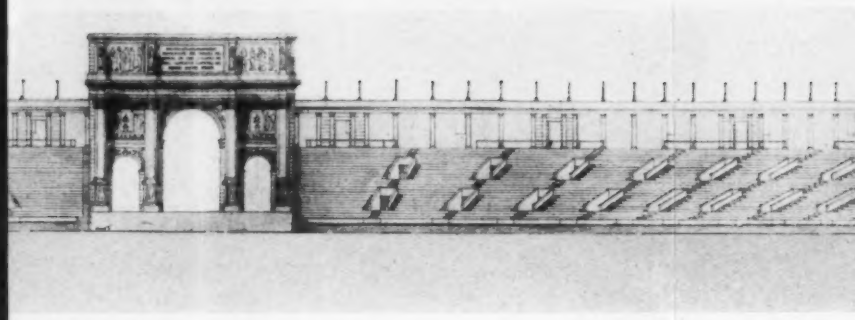


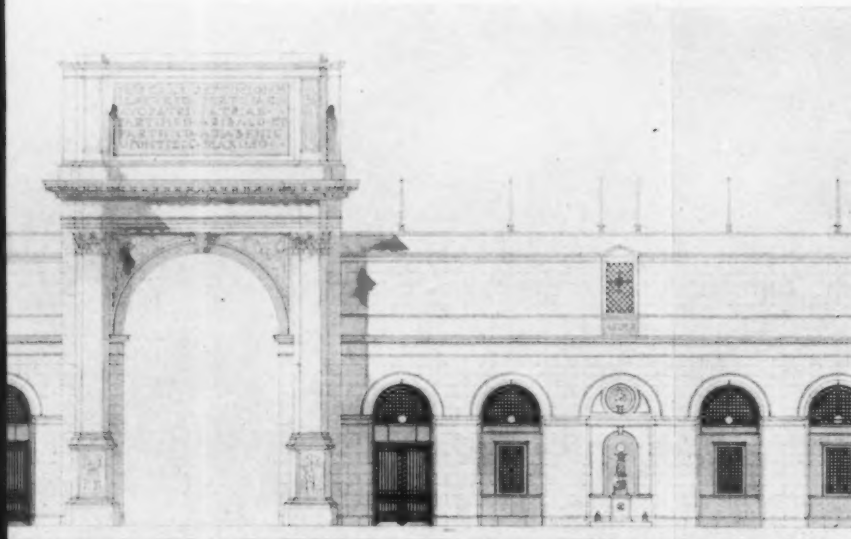
NORTHEAST AND NORTHWEST ENT



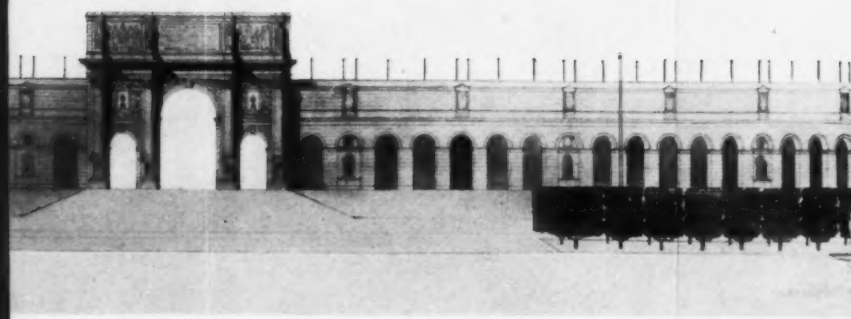
SOUTH ELEVATION



RANSVERSE SECTION LOOKING SOUTH



RTHEAST AND NORTHWEST ENTRANCES



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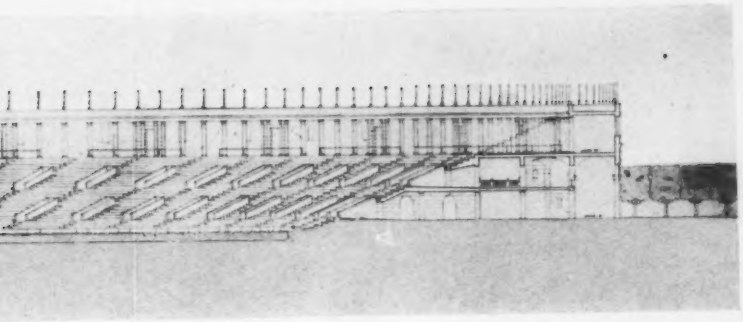
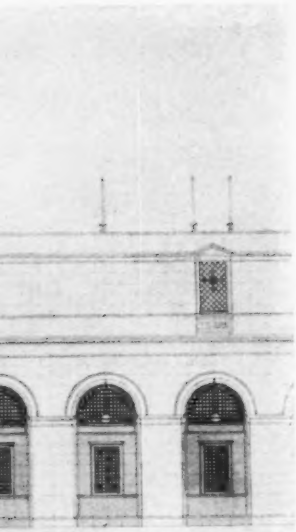
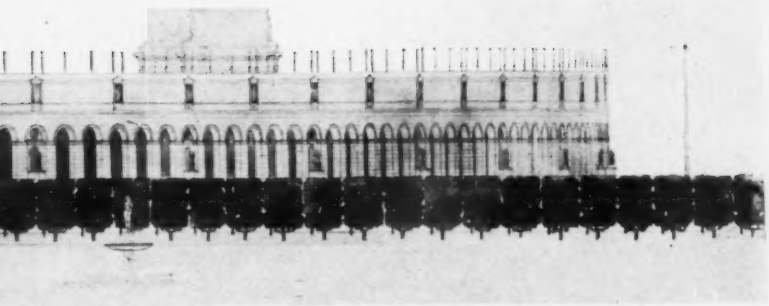




DESIGNS SUBMITTED
BY
COOLIDGE & HODGDON
*ARCHITECTS*



designer, the merchant and the manufacturer, there is complete recognition of the fact that the interests of the museum are closely related to the interests of modern commerce and industry. In this co-operation the museum's part will be to guide each effort in any line of production to the attainment of a successful decorative performance.

American art in the future may be new, but if it is to be worth anything it must have its background of legend. In this connection it is well to state that American industrial art has recourse to a supply of rich material for utilization that belongs peculiarly to its own province; I mean art and craftsmanship of the various native races of North and South America. It is very interesting to note that there is at present a distinct tendency among designers visiting the museum to take their motifs from these native American sources.

It is being said that the life and legend of the Indian were marked by a rich spiritual experience in keeping with the vast continental spaces in which he dwelt for ages—the first of mankind to gain a knowledge of the gods that he recognized in forest and lake and mountain and plain of this his native land; the first to live in close communion with them and to give passionate utterance to these themes in his native art. I have no doubt that the appeal that this utterance makes to many Americans and that attracts many designers instinctively to aboriginal American traditions in their search for fresh inspiration has its source in the unconscious influence of nationality.

Perhaps, as some advanced artists claim, these ancient and long-cherished American themes, under the impact of a new civilization, may liberate a spark that will kindle an enthusiasm among Americans for whatever is true and beautiful in their everyday environment. It would be entirely in keeping if the energy thus set free, acting directly on native American design, recast in new molds and informed by European tradition, should prove a powerful agency in the production of an American industrial art with a character of its own.

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# The Charm of Natural Planning

IN the various schemes which are put forward in these days for city planning and development the main fault seems to me to lie in the attitude of the designer, which is usually that of a cold and calculating schemer, writes M. H. Baillie Scott in *The Architectural Review* of London. This brutal and callous scientific spirit can never give to us the city of our dreams. We must set out to realize as far as we can the New Jerusalem —a heaven on earth—and test all our conceptions by the touch-stone of that ideal. We ought to approach the matter from the right end and start with the unit of our design, which is the house itself. And since it is desirable that houses should be of rectangular form, it follows that groups of houses should be rectangular, too, and that radiating and diagonal lines of roads which chop the buildings adjoining them into awkward shapes should be avoided. The best plan for a city is surely the old one—in which within a walled enclosure four main roads meet in a central market square. The four wards of the city are subdivided into smaller squares by smaller streets, and this scheme logically implies the arrangement of houses into courts approached by archways from the streets. This court arrangement, of which we find so many beautiful examples in old towns, is surely the finest way we can conceive of combining buildings, and more especially so when the scale is not too large. For an example near at hand, could anything be better than the little court of Staple Inn with its old paving and central tree? Such exquisite surprises as that are worth all the dreary endless avenues our town-planners rejoice to inflict upon us.

Apart from scientific expediency, the modern town planner seems chiefly to aim at "splitting the ears of the groundlings" by something colossal and immense in scale. He has yet to learn that art is not a question of avoirdupois and that the best kind of beauty is to be found in quite simple and humble things. The vulgar desire to "lick creation" with some immense building seems to pervade all our modern conceptions. It is the Prussianism of art. Adjoining buildings of reasonable scale are dwarfed by colossal monsters built at huge expense. Examples in this kind are to be found in most of the central parts of London, and all the sane and simple work of the eighteenth century has to give way to hideous vulgarisms in stone. Nothing is more pitiable as a spectacle than this puffing and blowing and strutting like the frog in the fable on the part of our designers. It is a disease of the mind, and in any modest and sane community would be treated as such.

But, bad as such buildings are in their senseless waste of human labor, they are not perhaps so

disastrous as the modern suburb, and more especially when it takes the form of what is called, for some unknown reason, "the garden suburb." Here we have vague and sloppy arrangements of dwellings which go to the other extreme of scale. They are gabled and fussy and petty. They pose and smirk at us in their self-conscious artistry. It is the fashion now to say rude things about the slums, but there are not a few back streets in London which merely want cleaning up to make them excellent dwelling-places for those who do not want to be waylaid by self-advertised art at every corner. For my own part, I would choose one of these in preference to any garden suburb I have seen. They are restful and peaceable and honest, and they make no pretensions of any kind.

And now we have invented a new horror in building. It is the colony of "dwellings for the working classes." The phrase itself carries with it the condemnation of our social system, implying as it does a broad division of the community into those who work and live in duplicated little dwellings imposed on them by the State, and those who don't work and who live where they like or can.

Would it not be possible to return to the old and better way of building, when towns were definitely outlined conceptions set in natural country surroundings? If in such a case further building is required, would it not be better to start from a series of subsidiary centers instead of creating vague and nebulous suburban areas which are neither fish, flesh nor good red herring? And why should we isolate and segregate our workers like lepers from the community? In the old village the squire and parson contrived to exist in close association with their humble neighbors.

It is a question how far the making of a town should consist of the realization of a predetermined plan, or how far it should be allowed to develop naturally. It would seem the best way to lay down at least the main lines, and yet leave some possibility of variation in the lesser streets.

If a plan fully takes into consideration the levels of the ground and local features such as trees, it will necessarily become somewhat varied in its general aspect. Planning of the best kind has all the air of natural development, because the designer has yielded to local conditions and allowed them to mold and modify his initial conception.

Where there is no vision the people perish. The materialism of science as applied to building will never satisfy our souls. Our towns and cities should be the expression of the best of the art powers of the community. That is the proper field of the artist, and not the collection of pictures in a gallery which no one needs, and only a few wish to look at. Building should be the highest expression of the spirit of man, and not merely a dull and soulless record of what are supposed to be his material needs. And we who enjoy the privilege of living in a country which still possesses so many great examples of old buildings have little excuse for ignoring the lessons they convey.

## Paris Has a Chinese Paper

The latest comer in the Paris press is a weekly newspaper printed in Chinese and edited by M. Daniel Fu, states a correspondent of the London *Mail*. The paper is intended for the benefit of the 80,000 Chinese coolies now working in France, 35,000 of whom are in the northern area. The sheet has been very thankfully received by these men, and 8000 copies of it are sold at two cents each. This price does not, of course, cover the cost of production.

As it was impossible to get Chinese type in France, the paper is produced by a photographic process. The sheets of beautiful Chinese characters, handwritten, are photographed and printed from the plates. This is the first Chinese newspaper to be produced in France.

It is significant that Chinese Coolies, known as the poorest classes of that great nation, are not too poor to have acquired an education sufficient to create a desire for papers in their own tongue, and a means for duly availing themselves of such papers. It is also probable that such a paper will sooner or later confront France with a condition similar to what America is now facing—a foreign language press that in self-preservation encourages everything peculiar to the nation it represents, and garbles the actual status of American affairs to breed discontent and disloyalty. There can be no unanimity of feeling while the foreign language press is dominated by un-American interests, and until it is either entirely abolished or at least completely reorganized under an American management this country will have little opportunity to accomplish the purposes for which it strives.

# Current News

## Happenings and Comment in the Fields of Architecture and the Allied Arts

*In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.*

## Deferred Architectural League Exhibition Now Being Held

The thirty-fifth annual exhibition of the Architectural League of New York was opened with a dinner on Feb. 26 at the Fine Arts Building, 215 West Fifty-seventh street, where its entire original collection of paintings, sculptures, architectural designs and other works of art, valued at more than $500,000, was destroyed by fire on Jan. 30 last. The present exhibit includes some of the valuable designs that were saved from that disaster, and they still bear signs of smoke and flames where they hang on the charred walls of the Vanderbilt Gallery.

A plea for the cultivation of a more sympathetic understanding between artists and craftsmen was made by J. Monroe Hewlett, ex-officio Chairman of the league, in the course of his address to the 150 guests at the dinner. The present time, he said, demanded that co-operation should be brought about between those who do the designing and those who produce the manufactured article. The Architectural League, he said, was pre-eminently qualified to promote such an understanding. The speaker said a committee had been appointed and already was at work on plans for a home for the organization.

The medal of honor for the best architectural exhibit was awarded to Delano & Aldrich, represented by a collection of pictures and plans of country houses. For his painting, "Diana and the White Horse," which was destroyed in the fire, Arthur Crisp, vice president of the league, received the medal of honor for the best painting. The honor medal for landscape architecture went to the firm of Vitale, Brinckerhoff & Geiffert.

## Columbia's School of Architecture Offers Spring Courses

In addition to the facilities for architectural study outlined in connection with the Avery Library notice previously referred to, the School of Architecture in Columbia University also has its own departmental library, a collection of about 18,000 photographs and several hundred books, a classified library of many thousands of prints and plates chiefly from current periodicals in the field, and a number of original drawings, including examples of architectural draftsmanship from the Paris Ecole des Beaux Arts and other sources.

A collection of about 16,000 lantern slides, constantly augmented, is in daily use for illustrated lectures on the history and theory of architecture, painting and sculpture, on ornament and the allied arts. The school also possesses a valuable collection of casts for use in the drawing rooms and general illustrative purposes, including fine models of parts of the Parthenon and of Rheims Cathedral and many casts from ancient and modern buildings given by the late Charles Follen McKim.

The illustrative material on the constructional and architectural engineering is extensive, comprising a variety of building materials and appliances and a number of especially prepared architectural models.

Five general fields of construction constitute the full uniform curriculum for all students in the school. They are design, history, drawing, graphics and mathematics, and construction. The work of all students in design is brought together on an assigned date and judged by the members of the school staff assisted by a group of practising architects.

While the School of Architecture admits only students who are candidates for a degree, provision is made under the Department of Extension Teaching for students who are not qualified for admission to the school or who cannot command the daytime for pursuing the courses. During the spring session extension courses, afternoon and evening, will be offered in a wide range of subjects, including elements of design, descriptive geometry, shades and shadows, stereotomy, perspective, specifications, building materials and construction, structural design, renaissance and modern architecture, ancient ornament, medieval ornament, principles of composition, drawing in water colors, charcoal and life, and pencil and modeling.

Instructions in extension teaching will be given by regular instructors of the School of Architecture, including Professor William A. Boring, Professor G. A. Harriman, Professor Alfred D. F. Hamlin, H. Vandervoort and George M. Allen.

## Sculptors Meet With Illinois Chapter

*(By Special Correspondence to THE AMERICAN ARCHITECT)*

Chicago, Ill.—Architects and sculptors of Chicago got together recently at the Art Institute, at the instance of the Illinois Chapter of the American Institute of Architects, of which Henry K. Holsman is president, and discussed the need of adapting sculpture to concrete construction. The idea was suggested by Miss Nellie Walker, a local sculptor, and endorsed by Lorado Taft, who was a guest at the dinner.

"I am very much interested in this new concrete idea," said Mr. Taft, who spent several months in France among the A. E. F., with the educational corps of the U. S. Army and who referred to his army experiences. "It seems to me that sculptors can do something in concrete that will add materially to a building of this character. I have now under consideration a soldier monument on which the committee in charge does not wish to spend as much as they should, if the design is to be in marble or bronze, and I am going to suggest that I be permitted to try it out in concrete."

Discussing the adaptation of concrete sculpture to the modern concrete building, Miss Walker said:

"It seems to me a touch of decorative beauty might be added to the skyscraper, the warehouse or the apartment building constructed of soft stone or concrete. Of course,

we would like to see our buildings of granite and beautiful stone, but concrete is with us and it should be our privilege as sculptors and as architects to make it less ugly. But a new style design must be developed to meet this concrete age and sculptors and architects should get over being afraid of each other and work together toward this end."

In discussing the relation of sculpture toward architecture, Miss Walker said:

"Architects need the aid of sculptors to embellish and enrich buildings, but too few sculptors have any knowledge of architecture and architects are rare who have an understanding knowledge of sculpture. I feel that a little knowledge of architecture on the part of sculptors and a sympathetic appreciation of sculpture among architects would provide a tremendous step forward toward a much desired co-operation.

"I cannot always draw an intelligent sketch for the architect and ask him to develop and refine. I feel that if I had sufficient architectural knowledge to do that, my idea would not be lost in the final work."

English period furniture was discussed before the Illinois Chapter by Robert J. Clark, of John A. Colby Co., with illustrations showing furniture of the Elizabethan, Queen Anne, Charles I. and II. and Henry VIII. periods, including Windsor and Chippendale designs, revealing how the architects of these periods worked with the cabinetmaker and the decorator to create a harmonious building.

Interdependence of the arts was discussed by Director Eggers of the Art Institute.

## Art Students' League Competition

The Art Students' League of New York announces that a scholarship competition open to all art students in the United States, with the exception of those in New York City, will be held at the studios of the league in New York on March 31. Ten scholarships will be awarded for the work showing the greatest promise. Work in any medium, from life, the antique, portrait, etching, composition and also photographs of sculpture, may be submitted. Work should be sent flat, not rolled, and should be forwarded so as to reach the league not later than March 27, and must be sent with return express or parcel-post charges prepaid. The scholarships so given will entitle the holder to free tuition in any two classes of the league during the season of 1920-1921. The jury will consist of the following instructors of the league: George B. Bridgman, Arthur Crisp, A. Stirling Calder, Frank Vincent Dumond, Sidney Dickinson, Thomas Fogarty, Frederic R. Gruger, Robert Henri, Hayley Lever, Kenneth H. Miler, Boardman Robinson, John Sloan, Eugene Speicher, Frank Van Sloun, Mahonri Young.

## Seattle Architects Will Hold Exhibit

An architectural exhibition which bids fair to be the finest yet held in Seattle is being planned by the Washington State Chapter of the American Institute of Architects.

The official notice issued to the A. I. A. members explains the purpose of the exhibition and gives information of importance to those interested in exhibitions of this nature and is published herewith:

There will be an exhibition of Architectural Renderings, Photographs, Sculpture, Pottery and Furniture from March 28 to April 15, 1920, in the Galleries of the Seattle Fine Arts Society, 1213 Fourth avenue, Seattle.

It is not the intention to limit the exhibition to work of chapter members, but every effort will be made to select work which will contribute to the effectiveness of the exhibition.

Correspondence regarding the exhibition may be addressed to Andrew C. P. Willatzen, 422 Boston Block, Seattle.

The exhibition committee consists of Roland E. Borhek, Arnold S. Constable, J. S. Cote, Carl F. Gould, David J. Myers, Ellsworth Storey, Louis Swarz, Joseph Wilson, and Andrew C. P. Willatzen, chairman.

## Why Not Buy American Art?

The 115th annual exhibition of the Academy of the Fine Arts, recently opened to the public in Philadelphia, contains 413 works of art in oil and 105 pieces of sculpture. Whatever may be the final analysis as to the level of such an exhibition, states the Philadelphia *Ledger*, it goes without saying that both oils and sculpture represent a high technical facility and that the paintings, for the most part, have that size and appeal that make them easily handled in the modern home and in every way quite refreshing to live with, the latter factor a quality which, after all, is the test of a picture, ancient or modern. Moreover, in the matter of sculpture the preponderance of small objects which have all the value of bijouterie, as it were, also makes their possession an easy matter, while the fame of the American sculptor, as a creator of artistic garden pieces, also places some striking examples of this form of art at the command of almost every one in a community such as this, which contains more beautiful gardens within an easy radius of the city than any other center in America.

This being the case, it ought to be a matter of course that a very large percentage of the art exhibits should be disposed of during the seven weeks of the exhibition. But in all probability nothing of this kind will happen. The percentage of sales will be small, largely because the general public neither realizes its opportunities nor its responsibilities in this issue of American art. This is one of the curious phases of our art life, for if large purchases of our current art are made, they will be made on other occasions and through other instrumentalities. This has led those who know how vital a thing American art and who believe in it to organize groups calling themselves "Friends of American Art," in one instance, who endeavor to make the sales at the annual exhibitions bear some relationship to the output. Each community, of course, will get at this problem differently; but it would seem to be time for a new movement to be started here which will frankly plan for a greater number of sales and a more practical system of buying the pictures which are shown so as to bring art home as a personal appeal to every one, for the only appeal in the long run that counts is that which touches the pocket and leads one to be anxious to possess a work that the contemporaneous artist has produced.

However we may talk about art or however we may appreciate the artist in the abstract, if we are only moved to buy art which has survived the centuries we do not encourage that thing that all agree is to be the saving thing in American life. It is easy, of course, to speculate as to what might be done and at what outlay, but think what it would have meant to American art, just taking that wonderful period that began with the World's Fair in Chicago in 1893, if the major portion of the best works at our annual exhibitions had been absorbed annually and made rallying points on the walls of our homes. If we are to take the place we should occupy in the world

as a people of broad culture we shall have to stir ourselves and realize that lip service to contemporary art is not the way to encourage that thing that must be of the very marrow of our daily life.

## Wooden Houses in Great Britain

Although there has been much discussion in and out of Government circles lately on the subject of the proposed building of wooden houses as a means toward overcoming the shortage of dwellings in Great Britain, caused principally by the almost total cessation of building operations during the war, it does not appear that steps have been taken toward the systematic popularization of this type of building in Great Britain.

This may be in part because the average citizen of Great Britain has not a very clear idea of how a modern wooden dwelling, with properly constructed cellar containing laundry and heating apparatus, is constructed; his idea of a wooden dwelling is that it is a slightly built structure, suitable for a summer cottage but wholly unsuitable for human habitation in the winter. He has but the faintest conception of how the walls of such modern American wooden dwelling houses are constructed or of the meaning of such building terms as clapboarding, weather boarding, tarred-paper sheathing, furring, and back-plastering, or of the uses of storm doors and windows.

As an increasingly large number of prospective householders are, however, now becoming interested in this subject, it would appear as if there might be a demand in Great Britain for American current literature and publications dealing with the construction of modern dwellings.

## Oriental Rugs and American Floor Coverings

It is conceded that a fine Oriental rug is the most highly prized floor covering know to the entire world. No floor covering of modern times, either European or American, has ever seriously contested the artistic supremacy of the best Oriental weaves, writes *Good Furniture*. They will always remain in the realm of floor coverings what the sculptures of the Parthenon are in the field of sculpture, the great Renaissance murals in the field of painting or the celebrated windows of the Gothic cathedrals in the art of stained glass.

It is admitted that the superb rugs of the Orient cannot be produced by the methods of the Occident and we have not conceded by any means that our carpet designers and weavers cannot produce for us floor coverings which are as appropriate and as beautiful for twentieth century purposes as the carpets of Smyrna, Samarcand or Bokhara were for the purpose for which they were made during the periods of Oriental splendor.

We must not lose sight of the fact that the conditions which fine twentieth century floor coverings are called upon to meet are very different from those for which the famous carpets of the Orient were intended. The Oriental never walked upon his fine carpets with modern shoes. If he wore shoes at all he removed them when he made his devotions, kneeling on his prayer rug at home or in the mosque. The delicate fibre of wood or of silk woven into his carpets did not get the grinding wear of shod feet that the modern carpet is supposed to stand and, consequently, retained indefinitely the soft texture and pile surface of the weaving as it came from the loom. Obviously, our modern carpets must be differently woven to resist the inevitable wear that comes with daily use. For that reason they need not necessarily be less beautiful in color, design or texture. Oriental rugs can teach us much about the artistry of weaving floor coverings. For durability we must find our own solution.

A time will come when fine Oriental rugs will again be used as wall decorations only, as was the custom in the Orient long ago. They will become as highly prized decorative textiles as are the priceless Gothic and Renaissance tapestries that remain with us to adorn the walls of our art museums and the mansions of the wealthy. Fine tapestries have become comparatively rare. Fine Oriental carpets will become equally rare in the future. They are rapidly becoming scarce and the art of making them is dying out. Our own carpets and rugs are becoming finer in color, design, texture and workmanship, due to the manufacturer's efforts to adapt from Oriental weavers what fits modern conditions. True, machine-weaving has replaced hand-weaving but that was as inevitable as in other modern industries. But machine craftsmanship holds unexplored possibilities when guided by conscientious purpose and talent and skill. In that direction we must look for our fine floor coverings of the future. Our inspiration must come largely from the weaving masterpieces of the Orient but the finished result will depend no less on evolving beauty and integrity in terms of present-day needs.

## Shaw on Architecture

George Bernard Shaw has been so much given to expounding startling theories purely for the pleasure of shocking his readers that no one is now likely to take him seriously in his advocacy of a new doctrine, writes the Decatur, Ill. *Herald*. In spite of the fact that Shaw himself is responsible for it, this discrediting of his utterances is occasionally to be regretted because the Shavian nonsense often encloses a kernel of good sense that the world might profitably take to heart.

Such is the case in the most recent suggestion of the dramatist. Shaw wishes to make a case for better architecture and avoidance of the mistakes of the past in the building that must be done to meet the present housing shortage of the world. Every thinking person is heartily with him in this proposal, but perhaps for this very reason, because it would grieve him to find himself in agreement with any large number, Shaw can not let the matter rest with any such simple and common-sense statement.

He considers it necessary to cloud his argument with some spectacular heresies which will serve to make his audience gasp and preserve his own reputation for eccentricity. For the purpose his statements that every building should be knocked down at the end of 20 years in order to cure "worship of the past" and to force each generation to create its own art; and that so far as the destruction of houses and cathedrals was concerned it would be a good thing to have several more wars in order to destroy all the buildings in Europe, are admirable.

Even in these most extreme statements there is some element of truth. It is in fact desirable that each generation should create something of its own in the field of architecture as in other arts, but the way to attain this end is not by destroying the examples of the past. It is significant that creative individualism was never so much lacking as during the mediæval centuries, when the achievements of the past were forgotten or ignored. The creative, individualist spirit appeared in the Renaissance simultaneously with a revised interest in the classic examples of Athens and Constantinople.

A more recent example is afforded by the architectural "reign of terror," here in our own country only a generation ago, the period that produced the dwelling house of gingerbread adornment. More recently, return to the simple designs of our own Colonial days and of other recognized types is again bringing dignity and beauty to our residence streets.

Mr. Shaw's plea for avoidance of the mistakes of the past is praiseworthy, but the methods he would advocate are obviously useful only to give his opinions a picturesque setting.

## Annual Exhibit of Evening Work at Pratt Institute

Thursday evening, March 11, will be observed as "Visitors' Night" in the School of Science and Technology of Pratt Institute, Brooklyn, N. Y. The shops, laboratories, and drawing rooms of the school will at that time be open to the public, giving an opportunity to all persons interested in industrial education to observe the students at work in the various courses and to inspect the results and methods.

The School of Science and Technology provides instruction in industrial electricity, technical chemistry, mechanical drawing and machine design, strength of materials, stationary steam engineering and power plant operation, roof framing and stair building.

This school is now giving instruction in its evening courses to more than thirteen hundred men who are regularly employed in various vocations and who use these courses as a means to prepare themselves for more effective service.

## Personals

John H. Bickford Co., architects, 40 Central street, Boston, have moved to 6 Beacon street.

Alexander S. Deserty, designer, formerly of New York City, is now associated with Zink, Sparklin & Condolfo, Inc., architects, Munsey building, Washington, D. C.

Pratt and Witton, architects, have opened offices at 44 Broomfield street, Boston, Mass.

Flournoy G. Hagan announces the opening of an office in the First National Bank building, Paris, Kentucky, for the practice of architecture and structural engineering, the title of the firm to remain as Wm. K. Hagan & Son.

Geo. H. Schwan, architect, Peoples Bank building, Pittsburgh, Pa., has opened a branch office at room 72, Third National Bank building, Cumberland, Md., Gordon S. Barber in charge. They request all catalogues and samples from material houses sent to the new address.

Sorgi, Holmes and Sichtenstein, architects, 15 Ashburton place, Boston, Mass., have moved offices to 120 Boynton street.

Firm name of Somes and Parsons, architects, Beacon street, Boston, has been changed to E. M. Parsons and Company.

James S. McIntyre, architect, Clifford building, New Bedford, Mass., has moved office to Times building.

Hollis Parker and F. S. McBain have formed a partnership and will practise architecture at 210 Levy building, Houston, Texas.

## News From Various Sources

Hungarian palaces and estates which before the war were valued at from $100,000 to $200,000 are being purchased by Americans, Englishmen and Frenchmen for comparatively insignificant sums.

In some cases magnificent properties have brought only from $5,000 to $10,000. Dollars are now quoted at from twenty to fifty times their pre-war value.

* * *

Dr. Hugh S. Cumming of Hampton, Va., has been nominated Surgeon General of the Public Health Service by President Wilson. He succeeds Dr. Rupert Blue, whose term expired Jan. 15. Dr. Blue will remain in the Public Health Service, probably with the rank of an Assistant Surgeon General, doing research work which he has under way, including the fight on influenza.

* * *

Earnings far in excess of anything that had been anticipated were reported by the United States Steel Corporation for the final quarter of 1919. The income for the period, after provision for Federal Income and war excess profits taxes and interest on the bonds of subsidiary companies, was $35,791,302. The fourth quarter earnings were exceeded only by those of the third quarter, when the earnings amounted to $40,177,232.

* * *

Army recruits must now enlist for three years, except in the Field Artillery, Engineer Corps, and Chemical Warfare Service, in which one-year enlistments are still received. The quota of one-year enlistment men permitted in the army is virtually filled.

* * *

The National Bank of Commerce in New York announced the adoption of a plan by which it will pay half the cost of educational courses taken by its employees. The purpose is to encourage them to study subjects which will aid them in their work and pave the way for their advancement. One out of every five employees of the Bank is taking evening courses.

* * *

Decentralization of the country's banking resources and widespread distribution of wealth, indicated by an increase in banking resources of 1000 per cent or more in sixteen states since 1899, was shown by a comparison of present bank resources with conditions twenty years ago issued by John Skelton Williams, Comptroller of the Currency.

The banking power of the country twenty years ago was concentrated mainly in the East, the report said, and national banks in New England and Eastern States comprising but 6 per cent of the territory of the United States held almost 60 per cent of the total resources of all the national banks in the country.

* * *

Freight transportation through local rail and water terminals stopped and an embargo on shipments was declared as a result of a strike by union freight handlers in Boston. About 1200 men walked out. The men on all three roads are involved in demands now pending with the Railroad Administration for a wage increase, and the strike was declared in an attempt to hasten the decision.

* * *

Shipbuilding companies in the Delaware River district of the United States are offering Canadian mechanics $100 a week in the hope of making good the shortage of labor which exists in their yards, according to Herbert Lewis, secretary of the local Toronto union, International Association of Machinists.

# Weekly Review of Construction Field

## Comment on General Conditions of Economics With Reports of Special Correspondents in Prominent Regional Centers

UPON the release of the railroads from Governmental management there are reports of large orders for equipment. *Iron Age* says that the estimates of car contracts are as high as 100,000. Actual orders have been placed by the Santa Fé for 2,500; the Erie has ordered 1,000 box cars; the L. & N. and the Southern Pacific will build 1,000 cars each; and so on. These reports are encouraging to the belief which heretofore has managed to exist that present transportation difficulties cannot last forever.

Negotiations upon the wage problem are beginning between the representatives of the brotherhoods and the officials of the corporations It will not be long before the question will be brought before the Labor Court—upon which the public will have representation. This, at least, is the opinion of the representatives of the brotherhoods. Apparently they do not anticipate an agreement between the two committees.

Transportation has been serious crippled by the snow storms of February. But given time, the melting of snow is as inevitable as is the settlement of wage disputes.

The February car supply in the Pittsburgh district scarcely reached 65 per cent. In Ohio it was nearer 60 per cent.

The shortage of steel is the most widespread deterrent to building construction. It is felt from coast to coast. And it is therefore interesting to see that the statistics of production during February were unusually high. The average pig iron production during January was 97,264 tons per day; the average daily output during February was 105,006. The blast furnaces during February were increased by fourteen, increasing the daily output by more than 5,000 tons. Steel mills are accumulating large quantities of finished product; the manufacturers, however, are suffering two great difficulties—the car shortage and the fuel shortage.

Cars are being ordered, but months must elapse before they become actually available. There are 17,000 Canadian cars now on our lines which we have been asked to return. One of the difficulties in getting them back is that the roads are blocked with snow. It is a pity we haven't the rolling stock which we disposed of with so much difficulty when the A. E. F. left France.

## Building Operations in New York

THE report of building operations in Manhattan as compiled by Rudolph P. Miller, Building Superintendent, show a decided increase for February over the same month of last year. Plans have been filed for 28 new buildings to cost a total of $9,933,500, as against 16 costing $3,978,200 in February, 1919.

For the first two months of this year plans were filed for 73 new buildings costing a total of $23,977,500 as against 32 buildings costing $5,129,250 in January and February of last year; more than four times as much money for twice as many buildings.

There was an outlay for alterations to 309 buildings of $3,415,715 during the past month as compared with $954,480 spent for alterations on 223 buildings during the same month of last year. The buildings on which alterations were made were of the following types: 105 dwellings, 44 tenement houses, 61 stores and loft buildings, 31 office buildings, 11 hotels, 7 stables and garages, 6 places of amusements, 2 school houses, 1 church, and 1 municipal building.

## Building Production

THERE is some justice in the opinion of the *New York Evening Post* that many of the statements of increased building activity are "a case of optimism born of desire and motivated by want." It is true that the gross figures of contracts placed are giving, because of the decreased value of money, a somewhat exaggerated impression. It is true also that production in the building field has suffered in efficiency during the past five years as in every other field that felt the touch of war conditions. Untiring effort is necessary to re-establish the industry upon a pre-war basis—and better. The building industry feels the same wants as the rest of civilization from which it is in no sense isolated.

But it feels it with a difference. There are items of production which we may learn to do without. For them the outlook is dark. But in a climate such as ours buildings are a prime essential. During the war the reductions in the construction program were most unwise; and subsequently (in 1919) when there began to be a construction program the shortcomings in carrying it through were unfortunate. But housing has not become less in demand nor has the outlook in the building field become discouraging.

Following behind the urgently realized need for housing of our people and of our industries is the building program with its huge figures of projected construction, and keeping up as well as it can is the actual building, hampered on the one hand by the difficulty of securing material and on the other by the greater or less lack in enthusiasm for accomplishment among the building trades. The position for actual production is not at the head of the procession; its place is at the rear. Just now it is a bit too far in the rear but so long as it keeps going there is no occasion for actual discouragement and when it shortens the space between its own and the other two sections, as is expected to be done in this coming season, there is a moment for enthusiasm.

## Labor and Politics

IT is announced that all the Central Labor bodies in the State of New York are urged to support a bill dealing with rent profiteering. Very possibly there is profiteering in rent but bills in Legislature cannot alter the causes for a situation which makes the practice possible. Legislative bills when clever enough to be effective in such cases are like patent medicines which remove a symptom but permit the disease which causes the symptom to go on until it develops a new and sometimes surprising symptom. The best of such palliatives are of a simple homeopathic variety: the interests in the real estate fields should know

best how to curb their avaricious and ruthless associates and it is their advice which should be sought without the introduction of outside agencies. If there is a panacea they will know what it is.

But if rent profiteering is effectively done away with, it does not make housing for the people who have none. The production of new housing is a most important phase of the matter in which the direct application of labor may influence the consummation of an achievement. There is nothing legal or legislative about it.

The politics of this country have outgrown the stage when they were a machinery for mismanaging somebody else's business. A few weeks ago the American Federation of Labor expressed a political program which would bring all of their members to the support of those issues which furthered the interests of labor. Such a concentration of power, wisely used, could be of great benefit to the nation; but if it is to be another unintelligent and short-sighted antagonism to varied interests which seem superficially opposed it can accomplish nothing in the direction of development. The early exhibition of its policies in the New York State Legislature, if indicative, is certainly discouraging.

It would be distinctly appropriate for organizations of labor to become interested in the material production and manufacture of this country. Upon the craftsmanship and upon the quality of the output, upon working conditions and their effect upon production, upon the education of workmen through apprenticeship, and upon legislation and finance as they affect these and similar phases of industry their opinions and influence will be of inestimable value.

## Dr. Eliot Upon Building Economics

IN an article discussing the change of the public attitude toward strikes, published in the *New York Times*, Dr. Eliot, of Harvard, says:

"A decided majority of the American people have of late experienced a new difficulty in owning houses and small shops, and in living in houses of their own. On account of the exorbitant wages in all the building trades and in some of the trades which supply building materials, innumerable American families find themselves obliged to move from their own houses into hired tenements which are much less desirable as regards space, light, air, and the other means of bringing up children in a healthy way. This is a grievous descent in dignity, independence and comfort; and it affects every class in urban and suburban communities, and even in small towns and villages, except the downright rich. Wherever a plumber, electrician, gasfitter, painter, furnace and stovemaker, mason or joiner charges from 80 cents to $1.25 an hour, there the American family is forced into narrow, crowded, hired quarters; unless by good fortune or the gift of nature the householder can himself practice two or three of these fundamental trades.

"This degradation of family life is resented by the average American family which has children, and induces in them serious distrust of the prevailing wage-raising processes in trades which have to do with such necessaries of life, in the climate of the United States, as shelters, fuels, foods and transportation. The average American reflects that high wages in building trades have at least one drawback for people in the other trades or occupations—they raise rents, prevent new building and congest the population."

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*(By Special Correspondence to THE AMERICAN ARCHITECT)*

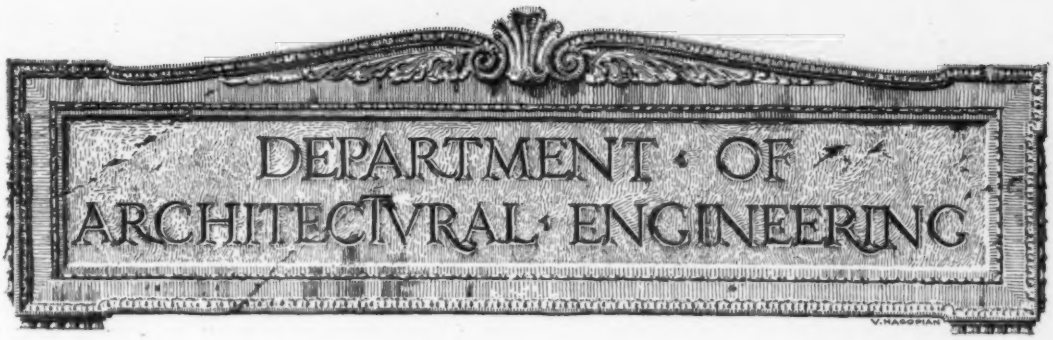
CHICAGO.—The building situation in Chicago is summarized for the week in excellent fashion by Gerhart F. Meyne, president of the Chicago Contractors' Association. In discussing the cost of building, he said:

"There has been a tremendous advance in the prices of material, in some instances as much as 175 per cent, and in other only as high as 70 per cent. Take, for example, the prices of cement in 1914 as compared with prices today. In 1914 cement sold at $1.25 net, while to-day it is selling at $2.65 net, an increase of 113 per cent; sand, which then sold at $1.60 is now selling at $2.35, an advance of 103 per cent; stone, which sold in 1914 at $1.60; is now selling at $3.25, or an increase of 103 per cent; lime has advanced from 65 cents to $1.75, or 170 per cent; bank sand from $1.25 to $3.25, or 160 per cent; common brick from $7 to $14, or 100 per cent; pressed brick from $22 a thousand to $38 a thousand, or 73 per cent. The increase in the price of lumber is from $28 to $72, or 160 per cent. The average increase, it will be seen, is 120 per cent. Steel has advanced in proportion. Owners of yellow pine land were selling stumpage in 1914 at from $2.50 to $5 a thousand; to-day the price of stumpage runs from $14 to $20. The land owner is doing the gouging in this instance. Freight rates have advanced 25 per cent. in addition to 1 per cent. war tax. Maple flooring is almost beyond reach. Manufacturers can get almost any price they ask for it. In December there was 9,000,000 to 10,000,000 feet of flooring on hand; now there is a demand for 52,000,000 feet. Hardwoods are in the hands of few and they will not sell. Producers have just begun to cut, and it takes a year or two to season it. Oak flooring shows the greatest advance in price. This is due to the foreign demand; 50,000,000 feet of oak flooring was bought in this country last Fall for export. They are now asking $250 per thousand for high-grade oak flooring, of the quality we use in high-grade apartment houses and in dwellings.

"Take the cost of pipe. I refer more particularly to that required for steam and hot-water fitting. Radiation in 1914 cost 15 cents; in 1916, 18; in 1918, 36; in 1919 it dropped to 31 cents then advanced to 39 cents, and we are pleased to-day if we can buy it for 45 cents—an increase of over 300 per cent on what it cost in 1914.

"The cost of construction is also influenced by the increased wages paid those employed in manufacturing material. The ultimate consumer is helping to pay for the increased cost of all the material and labor which goes into the construction of a building. Last, but not least, is the increased cost of labor, but it has not kept pace with the cost of material. In 1914 bricklayers were paid 75 cents an hour, as against $1 now, an increase of 33⅓ per cent; carpenters, 65 cents, as against $1, an increase of 54 per cent; laborers, 40 cents, as against 70 cents now, an increase of 75 per cent; bridgemen, 68 cents, as against $1, an increase of 47 per cent; cement finishers, 65 cents, as against $1, an increase of 54 per cent; plumbers, 75 cents, as against $1, an increase of 33⅓ per cent; plasterers, 75 cents, as against $1, an increase of 33⅓ per cent; steamfitters, 65 cents, as against $1, an increase of 33⅓ per cent. An analysis of the figures shows that the average cost of material and labor, in comparison with the pre-war figures, is $1.13. Now practically all of the building trades are asking for $1.25 an hour."

While building has not been discontinued as a result of the situation in Chicago, it has been delayed materially. Prices continue to advance both in material and labor. There is a decided scarcity of cement, glass, and some grades of lumber, while the money situation is still tight here. A plan is now being discussed by city officials and others to organize a "building corporation" in Chicago to build apartments and flats for rent, to care for the increasing demand for homes. There are no vacant houses of any kind in Chicago and suburbs.




# The Fundamental Principles of Illuminating Design

## A Practical Treatment of a Technical Subject in Which Simple Methods of Design Will Be Set Forth

THERE are many subjects in the treatment of which difficulty is encountered in forming a true conception of the materials involved. This is largely due to the lack of any concrete characteristics of the subject dealt with. One is placed in the position of Sir Oliver Lodge's audiences after he has described with much scientific detail that illusive and uncomprehensible material "ether." You come to a definite conclusion that it is and it isn't, therefore you have arrived nowhere.

While many materials as well as certain forms of energy belong to the realm of scientific research, some have a very direct and practical bearing on everyday life. Among these latter is light, especially artificial light.

Since the subject of artificial light is so intimately linked up with building construction, the architect, while he need not necessarily be conversant with all its scientific aspects, should at least acquire a fundamental knowledge of its use and application. As we have reached an era when conservation of our natural resources is essential, artificial lighting systems should be designed to provide the utmost efficiency. No place of business can to-day operate at maximum efficiency when improper lighting facilities are provided, and adequate lighting does not necessarily require a great quantity of light. The quality and distribution are equally important.

In order to predetermine the lighting requirements for any kind of building operation, it is necessary to know the quantity of light required to carry on, without eyestrain, various occupations. Because continued eyestrain results in serious defects in health, many states have now passed laws specifying minimum light requirements for various industries. Any building erected in such states in which the lighting equipment fails to provide the legal intensity of illumination violates the state law, and such alterations as are necessary to bring the lighting equipment up to the standard set forth can be ordered.

The subject of Industrial Lighting codes was fully discussed in an article by G. H. Stickney, published in three parts in the AMERICAN ARCHITECT, issues of May 14th, 28th and June 11th, 1919.

A later article on the subject of illumination will include a table giving required and recommended practice for lighting intensities for various building occupancies.

Before we can intelligently proceed with the subject of light, it is first nceessary to become familiar with the units employed in its measurement. Until recently it was common practice to designate lamps as so many candlepower. This method was unsatisfactory and gave a false impression as to the illuminating capabilities of the lamp.

*Intensity:* — To-day the "foot-candle" is the standard unit of measurement of light intensity. It is that intensity of light produced by a standard candle on a plane distant one foot therefrom. This is illustrated diagrammatically in Fig. 1. A practical conception of this value can be obtained by reading a newspaper by the light of an ordinary candle placed one foot distant from the sheet.

*Quantity:*—Light waves emanate in all directions from the source. The aggregate quantity of light

falling on the inner surface of a series of enclosing spheres of varying dimensions (the source being located at the center) would be the same, but the intensity would vary inversely as the square of the distance of the surface from the source of light. Thus it will be seen that a source of light of one standard candle (or one candle-power) will give an illuminating intensity of one foot-candle on a surface distant one foot, but of only .01 foot-candle on a surface ten feet distant. This principle is illustrated graphically by Fig. 2. In the nearest plane the quantity of light included within the projection lines covers but one square foot of surface, while at a distance of three feet it is spread over an area nine times as great. The total quantity of light is the same in both instances

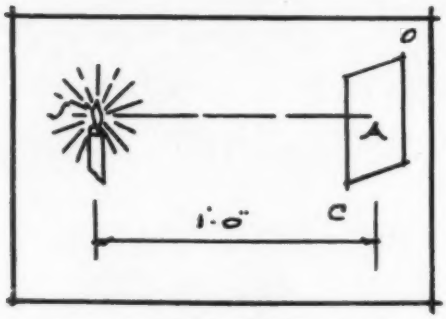



FIG. 1. THE ILLUMINATION AT "A" IS 1 FOOT-CANDLE

but the unit intensity differs. A homely illustration would be to spread one cubic inch of butter on one slice of bread. The amount would be more than adequate. Now if the same amount were used to butter nine slices, it would be very thinly spread out. In each case the total quantity is the same, but the amount per unit area of surface varies.

The quantity of light projected by a source of one standard candle on a plane one square foot in area placed at a distance of one foot is known as a lumen. If a standard candle is placed at the center of a sphere having a radius of one foot, every portion of the surface (being one foot from the source) will be illuminated to an intensity of one foot-candle, and the quantity of light projected on every square foot of surface will be one lumen. Since the area of such a sphere is 12.57 sq. ft., the candle will have a value of 12.57 lumens. In this case unity is the mean spherical candle-power of the lamp, which if multiplied by 12.57 gives the number of lumens emitted. Thus to obtain the number of lumens produced by a source of light multiply the mean spherical candle-power by 12.57.

*Measurement of Light.*—There are various instruments for measuring light intensities, the simplest for all practical purposes being the foot-candle meter, illustrated in Figs. 4 and 5.

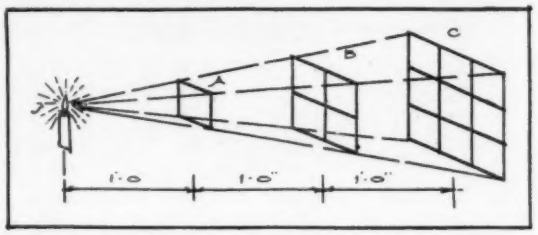



FIG. 2. THE ILLUMINATION ON A SURFACE VARIES INVERSELY AS THE SQUARE OF THE DISTANCE FROM THE SOURCE TO THE SURFACE

In operation it is placed upon or adjacent to the surface on which a measurement of the foot-candle intensity is desired. A standard lamp within the box illuminates the under side of the screen to a much higher intensity at one end than at the other. The voltmeter is set at the designated line by adjusting the rheostat which is in series with the dry cell and standard lamp. We look at the foot-candle scale and determine merely the point at which the brightness of the translucent spots, lighted by the standard lamp inside the light box, equals that of the illuminated background, which receives the intensity it is desired to measure. In Fig. 6 it is apparent that the spots at the right are lighter than the background—those at the left of the scale darker. In between, at some point, the brightness of the spots and of the background is the same, and at this point we read directly,

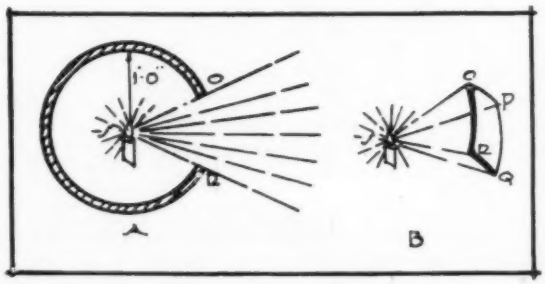



FIG. 3. A—OPENING "O-R" HAS AN AREA OF 1 SQUARE FOOT AND EMITS 1 LUMEN. B—ONE LUMEN FALLS ON SURFACE "O-P-Q-R." TOTAL AREA OF SPHERE IS 12.57 SQ. FT.

without manipulation of any movable parts, the intensity of illumination—in this case, 5.5 foot-candles. Minimum attention is required in making this determination and we are able to walk about, rapidly noting the manner in which the intensity

of illumination varies from point to point in the room and in the different planes at a given point. It soon becomes possible for us to visualize the light conditions in a room quantitatively. It is no more necessary to know the principles involved in the foot-candle meter than to understand the operation of a voltmeter in order to read voltage correctly.

The accuracy of the foot-candle meter is of the order of from 85 to 90 per cent, which is sufficient for all but very exceptional cases. Where accurate comparisons between different lighting equipments have to be made, larger instruments must be employed. The foot-candle meter is, then, distinctly a popular instrument; the other larger portable photometers are professional instruments, and they will be needed just as much in the future as in the past. The foot-candle meter will be found of much benefit to the architect and should be an important part of his equipment.

Now, to get at the practical application of the units of light measurement, let us assume a specific case, remembering that the foot-candle represents the unit for measuring intensity and the lumen quantity. For example:

FIG. 4. FOOT-CANDLE METER

What size lamp should be used to illuminate a room 10 feet square, to be occupied by jewelers working at gold and silver polishing?

According to the N. Y. State Industrial Code, a minimum intensity of 5 foot-candle is required at the work. The area to be illuminated is 100 square feet. Since an intensity of one foot-candle over one square foot requires a quantity of light of one lumen, five lumens will be required over each square foot of working surface. The total quantity of light necessary adequately to illuminate the entire surface will be 5 x 100, or 500 lumens. A 60-watt Mazda B lamp (mean spherical candlepower = 47) has a value of 585 lumens. Therefore, if every scintilla of light produced by such a lamp could be evenly projected and distributed over the entire working plane, such a lamp would prove adequate. Such an ideal condition, however, is not

FIG. 5. INTERIOR VIEW OF FOOT-CANDLE METER

possible. To provide for practical limitations several additional factors must be introduced into illumination design. At the beginning of this article mention was made of the importance of quality and distribution of light as well as its quantity and intensity. The next article will deal with methods of light distribution, and we will see how the above calculation must be modified in order to obtain the desired results.

FIG. 6. FOOT-CANDLE METER SCREEN INDICATING 5.5 FOOT-CANDLES

# Fire Protection for Schools

## Part I—General Considerations

*By* H. W. FORSTER.†

[The National Fire Protection Association's Committee on Safety to Life is actively engaged in studying the school egress problem, and this committee and the whole Association are actively interested in fire prevention and fire protection for schools. It is hoped that this article will prove a timely contribution in the effort to increase the safety of life in schools. The facts presented in this article are as applicable to the colleges and universities as to the grammar and high schools of the country.—*The Editors.*]

IT IS a far cry from the little red schoolhouse on the hill, with its one room, its handful of pupils, its chief fire hazard, the stove, out in the open where it is easily seen, its bucket of water, and its doors opening into the yard, to the modern city school, several stories in height, housing hundreds of children, and presenting complicated problems of fire prevention, fire protection and egress.

The property loss in schools has been large; the loss of life has been considerable; the fire risk in most existing buildings is great. The thought, energy and money put into furthering life and property safety in schools have not even approached that warranted by the jeopardy to the lives of the nation's greatest asset—our children.

While considerable improvement has been made in the last decade in the construction of new buildings, and also in the improvements of many existing structures, the fact remains that the large majority of schools in use to-day may become charnel houses instead of effective agencies of human advancement.

Business men who have created excellently safeguarded manufacturing and merchandising properties when serving on boards of education apparently do not view the American child as worthy of the same protection as buildings, machinery and goods. Possibly they argue that children can walk out of a burning building whereas goods cannot. Generally in event of fire the children do escape, but occasionally heaps of charred bodies of little children scathingly rebuke the judgment exercised and the parsimony practised in the field of creating greater fire safety in schools.

Ignorance of even fundamental principles of fire prevention and fire protection on the part of those vested with the management of schools is one of the chief factors that make for the existing poor conditions.

No matter how great may be the poverty of an educational institution, it should not disregard any fire precautions that are relatively inexpensive, and it should spend at least a moderate sum each year for the gradual improvement of its most dangerous buildings. When the seriousness of the situation is generally recognized—and it is a fact that over 90 per cent. of our school buildings are potential death-traps—prosperous and philanthropic citizens will leave money to their alma maters and to the school systems of their cities for the furthering of fire prevention instead of for the addition of another building, frequently of inferior construction.

The object of this article is not only to set forth the vital necessity of improving the conditions of our educational institutions, but also to point out specifically the problems which confront substantially every public school, private school, college or other institution.

*Statistical Data.*—At the present time there are in the United States approximately 300,000 buildings used for educational purposes, valued at more than $3,000,000,000. A very considerable number are erected each year, and it has been estimated that for every two new schools erected each year one is destroyed by fire.

The Actuarial Bureau of the National Board of Fire Underwriters, reporting only on fires where insurance was in effect, advises that for the two years regarding which complete information is now available the facts are as follows:

1916. No. of fires, 2498; property destroyed, $4,333,025.
1917. No. of fires, 2417; property destroyed, $4,051,680.

Because of the great extent to which schools carry their own insurance, it is certain that the total number of fires and the amount of losses have been greatly in excess of these figures.

No accurate records have been kept of the lives lost in school fires, or any other type of fires for that matter, and consequently exact data are not available.

*Abstract (in three parts) of an article prepared and printed for the Department of the Interior, Bureau of Education, by the National Fire Protection Association.

†Chairman, Committee on Safety to Life, National Fire Protection Association. Chairman, Committee on Fire Prevention, National Safety Council.

The essentials of fire safety for schools, and, in fact, for practically all other structures, are developed more in detail later in this article. In order, however, that a clear grasp may be had of certain fundamental and common-sense principles, it is well to summarize in order that those interested may grasp the basic features of the whole problem.

Obviously the way to escape fire danger is to have no fires. That means fire prevention.

The next best thing to preventing a fire from starting is to see that any fire that starts is invariably extinguished while it is still small. The automatic sprinkler system is beyond question the most dependable device for accomplishing this, as is witnessed by a remarkable record of performance covering thirty-five years, which is summarized in the following statement unanimously passed by the National Fire Protection Association at its 1914 convention:

> It is to-day an almost unquestioned fact that automatic sprinklers afford the highest degree of protection against fire in practically all cases where there is combustible construction of material, the rapid burning of which is liable to be a menace to the lives of occupants of the building.

Structural improvements and the use of fire-resistive building material in new buildings make possible a degree of safety in them which cannot be secured in existing structures except by the application of automatic sprinklers.

Upon the carefulness and diligence exercised in fire prevention measures, and upon the provisions made for promptly extinguishing fire when fire prevention measures fail, depends to a considerable extent the problem of arranging for satisfactory egress. Obviously a one-story building with doors opening from every room directly to the outdoors has little in it in the way of egress problems. The egress difficulty in the multi-storied school is quite another question. The Committee on Safety to Life of the National Fire Protection Association is now developing the school egress problem in detail. Its preliminary report will be found in the 1919 Proceedings of the Association, and should be studied carefully by all authorities interested in this important matter.

Closely associated with adequate egress facilities are the suitable education and organization of those responsible for fire safety in schoolhouses—the provision of automatic alarms, the systematic conduct of fire drills and the proper education of teachers and pupils.

There is necessarily a close interrelation between all of these various problems, and such interrelation should be borne in mind in reading the following sections of this article.

The data presented are based upon investigations extending over a period of fifteen years, a detailed examination of several hundred schools located in different States, and a careful study of the available literature on this subject.

(*To be continued*)

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## Waterproof Glues

*By* HENRY A. GARDNER

IN THE paint industry, animal glues (gelatine) and vegetable glues (processed starch) have been used as adhesives for cold water paints and calcimines, and for labeling gums. These forms of glue possess the undesirable property of becoming weak when exposed to moisture or subjected to the action of water. As a result of war-time endeavors to develop satisfactory glues for seaplane plywood, laminated gunstocks, and other products, there became available glues produced with casein or blood albumen as a base. These glues have extraordinary water-resisting properties. Plywood made of 3-ply veneer 1/16 inch thick glued with casein glue may be boiled in water for eight hours and still show an average breaking load of not less than 90 pounds per square inch. One-inch test blocks may be placed together with this glue and show a shearing strength of 2200 pounds per square inch.

Casein glue is cheaper than blood albumen glue, and is probably more practical for most commercial purposes where application is made by hand rather than by machine or hot press. It is possible that casein glue might be found useful as a base for label pastes. Its slightly alkaline reaction would etch the surface of tin with the possibility of greater bonding power than some other adhesives. Because of its high waterproofing properties it might also be useful as an adhesive in calcimine and cold water paints. The writer has experimented with such glue as a part of the liquid portion of exterior paints, and secured interesting results. If desired, casein glue may be prepared direct from casein by the addition of moderate and well-regulated amounts of slaked lime, caustic soda, or sodium silicate. As a rule, however, it is advisable to purchase the glue in prepared form, since carefully selected and finely divided casein, having a very low acid, fat, ash, and moisture content, and high nitrogen content, is used for this purpose and skillfully mixed to produce a successful product.

It is of great importance when any type of casein glue is used that it be properly mixed. Otherwise unsatisfactory results might follow. One of the best mixers is of the change can, bladed type, such as is used for mixing paint previous to grinding. The dry powder is placed in the mixer and

from one to two parts of water added, according to the degree of fluidity desired. It is preferable that the container for the material should be of the enameled type, as copper, aluminum and brass vessels are slightly attacked by the glue. After the glue has been mixed, it is usual to allow it to stand for a period of one-half hour before use, in order to develop its full strength. Glue thus made, as a rule, will remain fluid for a period of five hours, although some types may remain fluid for a much longer period. After standing in aqueous admixture for 24 hours, most casein glues set up to a hard, unusable mass, and it is then necessary to make up fresh batches. The glue dries to a very waterproof film of great strength.

## Important Matters Discussed at Meeting of Engineering Council

APPEAL ISSUED FOR SUPPORT BY THE ENGINEERING PROFESSION

AN important meeting of Engineering Council was recently held in the rooms of the American Society of Civil Engineers, Engineering Societies Building, New York City. An all-day session was held and many matters of current interest were discussed. A brief summary is appended.

Doctor Alexander C. Humphreys, president of Stevens Institute of Technology, chairman of the committee on curricula of engineering, called special attention to the important field covered by this committee. Attention is directed to the fact that both Columbia University and the Massachusetts Institute of Technology are now providing six-year courses in engineering besides the regular four-year course. The committee has investigated the extension of engineering courses, but is not yet ready to recommend the adoption of a six-year course by engineering colleges. Undoubtedly other universities will take this matter under advisement. Universal military training is favored by the committee, who also recommend the extension of facilities for providing vocational training, especially in the industrial centers of the United States.

COMMITTEE ACTIVITIES

Employment Bureau reported 17,000 interviews, 4800 men registered, more than 1000 placed and total expenditure $10,600, in past ten months; 60 to 70 men call daily.

National Service Committee active in connection with national budget legislation, Congressional Commission on Reclassification of Salaries, mileage for former engineer officers, Interstate Commerce Commission and International Joint Commission vacancies, Industrial Conference, census classification of engineers, U. S. Topographical Mapping and Department of Public Works. Washington office used increasingly by engineers and Government.

Chamber of Commerce has admitted Council to membership. H. W. Buck appointed National Councilor and Delegate, and I. E. Moultrop alternate.

National Department of Public Works: Petition to Chamber of Commerce was voted by Engineering Council, asking referendum on bill for Department of Public Works.

License Committee, at five-day session in Chicago, October 13 to 17, revised draft of typical law for registration of engineers.

Classification and Compensation of Engineers: Progress in collecting and digesting data on Federal, railroad, State and municipal engineers. Final report on Federal service this month. Increases granted railroad engineers below $2,500.

Fuel Conservation Committee recommended support of legislation for investigating super-power generation and distribution in Boston-Washington district; so voted.

Joint Conference Report of Development Committees was discussed and letters sent to Founder Societies indorsing general plan for a national engineering council.

Financial statements: Total resources, $50,393; expended, 9 months, $32,651, including $10,601 for Employment Bureau and $17,038 for Washington office.

Tentative budget 1920: $60,000 needed for all purposes. Appropriations of Founder Societies must be supplemented by contributions from individuals.

Appeal for funds to be made at once to engineers throughout the country.

Water Conservation Committee reported twenty-seven correspondents appointed in as many States, and much useful information collected.

Curricula of Engineering Schools: Committee reported on six-year course.

Reconstruction Commission, New York: Advisory Committee's recommendations sent to governors of all States and many civic bodies in New York.

Patents Committee: Three bills, based on report of committees of National Research Council and Engineering Council, now before Congress.

Jurisdiction Awards in Building Industry: Board held first meeting in Washington August 11, report by Council's representative, R. P. Miller.

Types of Government Contracts: Important committee appointed.

Payment for Estimating: Three delegates appointed to meet Associated General Contractors and American Institute of Architects in Chicago.

National Budget: Four delegates sent on invitation of committee of House of Representatives discussed budget legislation.

Since this meeting an appeal for financial support has been made by Engineering Council to professional engineers and engineering assistants throughout the United States.

# Economy Resulting from Co-operation Shown in Housing of Local Government Offices in the New Pittsburgh City-County Building

AN IMPORTANT step towards the ultimate housing of all local governmental offices in one building was taken by the City of Pittsburgh and the County of Allegheny, Pennsylvania, when they recently jointly erected the handsome ten-story City-County Building. This structure which is built of brick and stone occupies an entire city block and forms an important addition to the civic center of the City of Pittsburgh.

The building contains practically all of the municipal offices and those of the county, and also those of the Allegheny County Bar Association which is said to have the largest law library in the county. It has 22 courtrooms, including one devoted to the use of the State Supreme Court.

The dimensions of the building are 185x300 feet, and the cost was approximately $3,000,000.

For the convenience of the public, the office of the City Clerk, Tax Collector, Prothonotary, Recorder of Deeds, are located on the first floor. On the floor devoted to general office purposes, there are 65 offices to a floor. All toilets are mechanically ventilated.

Twelve electrically operated elevators with pneumatically operated doors, furnish transportation to the various floors.

The grouping of the offices of both city and county in this manner not only makes it more convenient for the citizens, but it also eliminates the expense of maintaining two separate buildings with the attendant expense for heat, light, power for each.

A striking example of the advantages gained by the consolidation of the housing facilities of the two groups of offices is to be found in the control and distribution of the supply of electricity for light and power, which is effected through a carefully designed switchboard installation described below.

Three-phase alternating sixty-cycle current is supplied by the Duquesne Light Co., of Pittsburgh, at a pressure of 2200 volts, through two separate feeder circuits. This current is carried direct to a six panel, black marine finish slate board installed in the engine room which is 32 ft. by 122 ft. Protection to the incoming lines and the step down transformers is afforded by means of electricity operated oil circuit-breakers with automatic overload trips, which are mounted in a pipe structure at the rear of the board.

For operating elevators, cranes and other devices using directing current, two 300 KW, and one 200 KW, and one 100 KW, six-phase, 250 volt rotary converters are installed. Alternating current for supplying these rotaries is controlled from the six panel board previously mentioned.

The direct-current ends of the rotary converters are controlled from a seven-panel black marine finished slate board, and also two 2000-ampere, two 1200-ampere, and two 1000-ampere feeder circuits.

Both the A. C. and D. C. circuits are controlled by the main distribution board. This board is of the same construction as the two boards previously mentioned. It has 36 panels, is 80 feet long, and is divided into six general sections, three for alternating current and three for direct current.

It controls a total of 111 feeder circuits of 300-ampere capacity or less, 50 lighting feeders and 61 power feeders. The feeders are protected by automatic carbon circuit-breakers, those on the power feeders being equipped with self-contained inverse time element dash pots.

Each of the six sections has an incoming power panel ranging in capacity from 1000 to 3000 amperes protected by carbon circuit-breakers with voltmeter, ammeter, watthour meter, and graphic wattmeter for measuring the total amount of power used by each section of the board. In this manner proper charges can be apportioned to the city and to the county for the amount of current used by each.

The entire switchboard installation was built according to the specifications of Edward B. Lee, architect.

# Interesting Investigations Conducted by U. S. Bureau of Standards

THE United States Bureau of Standards has been conducting several experiments of interest to architects. The report of these investigations as summarized in an official technical news bulletin follows:

*Steel Analysis.*—It is becoming increasingly apparent that some non-destructive method for the testing of steel and steel products is urgently needed to supplement the present methods of vicarious testing. The Magnetic Laboratory has for some time past been investigating the possibility of utilizing the magnetic properties of iron and steel as indications of mechanical properties. The results already obtained indicate the possibility of applying magnetic methods to the study of the structure and properties of steel and to the testing of raw material and finished products. This application of magnetic testing has been termed magnetic analysis.

The present work of the laboratory consists of a study of the correlation between the magnetic properties of steel and its structure and mechanical properties, and the development of methods and apparatus for the application of magnetic analysis in a practical way. A method has already been developed for the determination of the degree of homogeneity along the length of a relatively long piece, this method being used by at least one railroad for research on rails. The successful application of magnetic methods which are non-destructive for the testing of steel and steel products will undoubtedly have great commercial value and may be expected to contribute a large measure of safety in cases where perfection of material is of prime importance.

*Reinforced Concrete.*—Work of a preliminary character has been carried out in the flat slab investigation. A slab, 25 by 20 feet, similar in construction to the main slab to be tested, was subjected to a load test which was carried to the destruction of the slab. The slab was built to fail under a live load of approximately 200 lb. per sq. ft. and 65 lb. per sq. ft. dead load. The first load applied was 97 lb. per sq. ft., and the next application 191 per sq. ft., but before the last loading was completed the center deflection had increased to such an extent as to be more than double that allowed by the most liberal city building codes. The under side of the slab was very badly cracked. Computations of the stresses developed in the steel reinforcement indicated that the rods in the middle third of the short span had been subjected to stresses far beyond the elastic limit of the steel, while in the middle third of the long span the rods had practically reached the elastic limit. Examination of a number of rods appears to indicate that failure by bond did not enter into the final failure, which seems to have occurred under tension, as was indicated from the design computations.

*Cement Drain.*—The field inspection of cement drain tiles in alkali soils is being continued. Several plants for the manufacture of this class of materials have been inspected and the subject has been fully discussed with those interested in it in some of the Western cities. Assistance was given to the Bureau by the District Engineer of the Portland Cement Association at Denver, who prepared a list showing localities where cement was said to have been exposed to severe alkali conditions for a number of years. Samples of tile which had been in place for 12 years at Delta Col., together with samples of water to which it had been subjected, were obtained, and will be used in an investigation to be conducted in the laboratory. The field inspection work for the year has been practically completed and from the data obtained laboratory investigations will be carried out to find means for producing concrete capable of withstanding alkali action.

*Concrete Oil Tanks.*—Continued observations on tanks under test show no appearance of an increased loss in any of the tanks and the exterior surfaces of all of them are dry. Two tanks of 1 : 1½ : 3 concrete have been put under test as oil containers and the observations begun. The first readings will show a much greater loss than subsequent ones, and, consequently, considerable attention is being paid to the first gage readings, in order to obtain with accuracy the initial penetration losses.

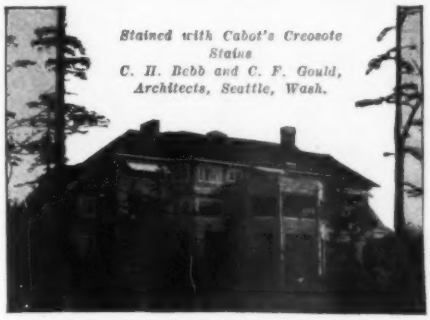
*Manila Rope.*—Tensile tests have been made on Manila rope to determine the effect of an asphaltum compound used as a protection to the rope against the action of muriatic acid. Results show that rope treated with the compound deteriorated as completely under the influence of the acid as the untreated rope.

*Oxy-acetylene Welding.*—The calibration of oxy-acetylene welding and cutting apparatus is practically complete. This work was delayed somewhat owing to the fact that a method had to be devised for determining the effective specific heat ratio of acetylene passing through the acetylene meter. The work has now progressed so far that actual welding can be started in a few days.

*Crane Test.*—At the request of the Navy Department, the Bureau will undertake a complete strain gage investigation of the 350-ton "fitting out" crane at the Philadelphia Navy Yard. It is expected that the low temperatures and winds of high velocity which will probably prevail at this time of year may make the work difficult.

*Corrosion of Lead.*—The investigation of the embrittlement of lead by corrosion has been completed. It has been found that the rate at which the intercrystalline brittleness is brought about is proportional to the amount of impurities and to the concentration of acid in the solution in which the lead is placed. Practically all the impurities which are found in the lead are lodged between the grains. The preferential attack by the corroding agents for these impurities, and perhaps also for the "amorphous intercrystalline cement," accounts for the brittleness produced. Investigation showed that specimens of exceptionally pure lead (99.99 per cent), when immersed for 24 days in a neutral solution of lead acetate, became appreciably embrittled by the formation of minute intercrystalline fissures. No evidence of the existence of an allotropic form of lead similar to gray tin could be obtained.

*Radiator Valves.*—The efficient operation of steam-heating plants depends very largely upon the performance of the thermostatic valves designed to drain the radiators of water. This is returned to the boilers, and thus a maximum amount of heat is maintained in the radiators. Such valves should operate with a minimum loss of steam; in other words, they should allow only water to escape. Performance tests under working conditions have just been completed on two sets of such valves submitted by the supervising architect of the Treasury Department. It is expected that the information furnished will aid in the selection of the proper type of valve for use under various conditions.



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*C. H. Bebb and C. F. Gould, Architects, Seattle, Wash.*

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The rich, transparent coloring effects are more appropriate and beautiful than any other colorings, and they wear better, cost less, and are easier to apply. "Painty" effects spoil the beauty of the wood, and paint costs twice as much. The creosote thoroughly preserves the wood. Don't buy stains that smell of kerosene; they are dangerously inflammable.

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**PEN ARGYL PENNSYLVANIA**

# Late Quotations in Building Material Markets

*(Price quotations now current on building materials and supplies as quoted by dealers and jobbers for delivery in New York, Chicago, San Francisco, Seattle, and Birmingham follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions, rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted, but will also present a basis to judge conditions as affecting correlating materials.)*

| | New York | Chicago | San Francisco | Seattle | Birmingham |
|---|---|---|---|---|---|
| **BRICK** | | | | | |
| Common | $30.45 | $14.00 | $16.00 | $18.00 | $28.00 |
| Face brick | 55.00 to 60.00 | 30.00 to 40.00 | 50.00 to 55.00 | 23.00 | 45.00 |
| **BURNED CLAY** (Delivered on Job) | | | | | |
| Block partition: | | | | | |
| 3 in., per sq. ft. | 0.13 | 0.10 | ..... | 0.10½ | ..... |
| 4 in., per sq. ft. | 0.15 | 0.11 | ..... | 0.10 | ..... |
| Wall coping (single slant): | | | | | |
| 8 in., per lin. ft. | 0.16 | 0.18 | ..... | ..... | 0.22 |
| 12 in., per ft. | 0.26½ | 0.27 | ..... | ..... | 0.32 |
| 18 in., per ft. | 0.54 | 0.54 | ..... | ..... | 0.52 |
| (Corners and angles four times the price of one foot of coping the same size) | | | | | |
| **CEMENT** | | | | | |
| Per bbl. in 15-cent bags (rebate 60 cents per bbl. for bags) | 3.40 | 3.25 | 3.63 | 4.25 | 4.50 |
| **FINISHED IRON AND STEEL** (Mill Shipments) | | | | | |
| Bar iron, refined grade | ..... | ..... | ..... | ..... | ..... |
| Bar iron, double refined | ..... | ..... | ..... | ..... | ..... |
| Soft steel bars | 2.62 to 4.52 | ..... | ..... | ..... | 4.00 |
| Shapes | 2.72 to 4.27 | ..... | ..... | ..... | ..... |
| **GLASS** (Discounts from Manufacturer's Price Lists) | | | | | |
| Single strength, A quality, first three brackets | 75% | 77% | ..... | ..... | ..... |
| Single strength, B quality | 75% | 77% | ..... | 83% | ..... |
| Double strength, A quality | 77% | 79% | ..... | 83% | ..... |
| Double strength, B quality | 79% | 79% | ..... | ..... | ..... |
| **GYPSUM** | | | | | |
| Plaster board: | | | | | |
| 27x28x1 | ..... | ..... | ..... | 0.36 | ..... |
| 27x48x ½ | 0.45 | ..... | ..... | ..... | ..... |
| 32x36x ¼ | 0.28 | 0.24 | ..... | ..... | 0.40 |
| 32x36x ⅜ | 0.29 | 0.26 | ..... | 0.36 | ..... |
| 32x36x ½ | 0.35 | ..... | ..... | ..... | ..... |
| Plaster blocks: | | | | | |
| 2 in. solid, 12x30, per sq. ft. | 0.13 | 0.12 | ..... | ..... | ..... |
| 3 in. hollow, 12x30, per sq. ft. | 0.13 | 0.12 | ..... | ..... | ..... |
| 4 in. hollow, 12x30, per sq. ft. | 0.14 | 0.13½ | ..... | ..... | ..... |
| 6 in. hollow, 12x30, per sq. ft. | 0.21¼ | 0.20 | ..... | ..... | ..... |
| **HOLLOW TILE** | | | | | |
| 2x 8x12 partitions, per 1,000 sq. ft. | 98.80-111.10 | ..... | 80.00 | ..... | ..... |
| 3x12x12 partitions, per 1,000 sq. ft. | 148.20-165.10 | 110.00 | 108.00 | 105.00 | 112.00 |
| 4x12x12 partitions, per 1,000 sq. ft. | 166.70-185.70 | 118.00 | 125.00 | 120.00 | 126.00 |
| 6x12x12 partitions, per 1,000 sq. ft. | 222.30-247.60 | 162.20 | 154.50 | 170.00 | 168.00 |
| 8x12x12 partitions, per 1,000 sq. ft. | ..... | 221.10 | 222.50 | 230.00 | 224.00 |
| 10x12x12 partitions, per 1,000 sq. ft. | ..... | 272.70 | 276.00 | ..... | ..... |
| 12x12x12 partitions, per 1,000 sq. ft. | ..... | 316.90 | ..... | ..... | ..... |
| 2x12x12 split furring, per 1,000 sq. ft. | 92.60-103.20 | 73.80 | 108.00 | ..... | ..... |
| **LATH** | | | | | |
| Eastern spruce, per thousand | 18.00 to 20.00 | 16.00 to 18.00 | 18.00 | 14.50 | ..... |
| No. 1 white pine, per thousand | 15.00 to 18.00 | 16.00 to 18.00 | 20.00 | ..... | ..... |
| No. 1 hemlock, per thousand | 15.00 to 18.00 | ..... | 18.00 | ..... | ..... |
| No. 1 yellow pine, per thousand | 15.00 to 18.00 | 16.00 to 18.00 | 18.00 | ..... | 20.00 |
| **LIME** | | | | | |
| Common, 200 lb. bbls., per bbl | 3.80 | 1.75 | ..... | 2.85 | 2.50 |
| Finishing, 300 lb. bbls., per bbl. | 19.50 | 20.00 | ..... | 3.25 | 2.50 |
| Hydrated, in paper bags, per ton | 4.00 | ..... | ..... | 25.00 | 2.50 |
| **LUMBER** (Retail Prices per Thousand Delivered) | | | | | |
| Yellow pine, No. 1 boards, 1x6 | 80.00 | 95.00 | ..... | ..... | 120.00 |
| Yellow pine, B, and better flooring (plain) | 130.00 | 135.00 | ..... | ..... | 130.00 |
| Douglas fir, 6x6 to 12x12 | 80.00 | 77.00 | 60.00 | 36.00 | ..... |
| Oak, quartered, 1 in., F. A. S. | 325.00 | 370.00 | 500.00 | ..... | ..... |
| Oak, plain, 1 in., F. A. S. | 225.00 | 260.00 | 320.00 | ..... | 270.00 |
| Oak flooring, ¼ quartered, white | 220.00 | 370.00 | 470.00 | ..... | ..... |
| Maple, 1 in., F. A. S. | 180.00 | 185.00 | 270.00 | ..... | ..... |
| Maple flooring, ¼ clear | 175.00 | 225.00 | 225.00 | ..... | ..... |
| Mahogany, 1 in., F. A. S. | ..... | 400.00 | 500.00 | ..... | ..... |
| Spruce, 10 in. | 85.00 | 80 to 140 | 96.00 | ..... | ..... |
| Cypress, 1 in., F. A. S. | 150.00 | 150.00 | ..... | ..... | ..... |
| **METAL LATH** | | | | | |
| Under 100 sq. yd., per sq. yd. | 0.40 | | ..... | 0.40 | 0.42 |

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ATLAS-WHITE
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## Late Quotations in Building Material Markets—*Continued*

| | New York | Chicago | San Francisco | Seattle | Birmingham |
|---|---|---|---|---|---|
| **PIPE** | | | | | |
| Cast iron: | | | | | |
| 6 in. and heavier | $67.30 | $72.00 | ..... | ..... | $66.00 |
| 4 in. | 73.30 | 75.80 | ..... | ..... | ..... |
| 3 in. | ..... | 82.80 | ..... | ..... | ..... |
| (And $2 additional for Class A and gas pipe) | | | | | |
| (Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.) | | | | | |
| | F.O.B. Pittsburgh Butt Weld | F.O.B. Chicago | | | |
| Wrought: | | | | | |
| Steel: | | | | | |
| Black, ⅛ to 3 in. | 47 to 54 % | 38 to 45.1% | ..... | $4.05 net | ..... |
| Galv., ⅛ to 3 in. | 20½ to 41½% | 10.1 to 30.1% | ..... | 6.10 net | ..... |
| Iron: | | | | | |
| Black, ⅛ to 1½ in. | 1 to 34½% | 11.9 to 22.6% | ..... | ..... | ..... |
| Galv., ⅛ to 1½ in. | +25 to 18½% | +39.9 to 4.6% | ..... | ..... | ..... |
| | Lap Weld | | | | |
| Steel: | | | | | |
| Black, 2½ to 6 in. | 50 % | 41.1% | ..... | ..... | ..... |
| Galv., 2½ to 6 in. | 37½% | 27.1% | ..... | ..... | ..... |
| Iron: | | | | | |
| Black, 2½ to 6 in. | 30½% | 18 % | ..... | ..... | ..... |
| Galv., 2½ to 6 in. | 17½% | 3.6% | ..... | ..... | ..... |
| **PLASTER** | | | | | |
| Neat wall cement in 15-cent bags, per ton | 23.50 | 20.00 | $18.50 to 20.00 | 22.50 | 24.00 |
| Finishing plaster | 25.00 | 20.50 | 19.50 to 21.00 | 24.00 | 24.00 |
| Lath mortar, in cloth bags, per ton | 16.50 | ..... | ..... | ..... | ..... |
| **RADIATION** | | | | | |
| Discount from list on standard heights | 45% | 41 to 42 | ..... | ..... | 44.45 |
| **REINFORCING BARS** | | | | | |
| High carbon steel from mill | 48.50 | ..... | 4.50 to 5.50 | 5.00 | ..... |
| Medium steel from mill | 48.50 | ..... | 4.50 to 5.50 | 5.00 | 4.50 |
| **ROOFING MATERIAL** | | | | | |
| Tarred felt paper: | | | | | |
| No. 1—25 lbs. to 100 sq. ft., per ton | 81.00 | 90.00 | ..... | 2.50 per cwt. | ..... |
| No. 2—16 lbs. to 100 sq. ft., per ton | 81.25 | 90.00 | ..... | 3.25 per cwt. | ..... |
| No. 3—12 lbs. to 100 sq. ft., per ton | 81.63 | 90.00 | ..... | 3.39 per cwt. | ..... |
| Rosin sized sheathing, per ton | 75.00 | ..... | ..... | 105.00 per cwt. | ..... |
| Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, per 100 lbs. | 0.30 | ..... | ..... | ..... | ..... |
| **SHINGLES** | | | | | |
| Red cedar, 5 to 2, clear, per thousand | 15.00 | 10.00 | 16.00 | 7.15 | ..... |
| White cedar, extra star, A star, per thousand | 16.00 | 9.50 | 17.00 | 5.75 | ..... |
| **SLATE ROOFING** | | | | | |
| | F.O.B. Cars Quarry Station | | | | |
| Pennsylvania: | | | | | |
| Best Bangor | $7.75 to $9.00 | ..... | ..... | ..... | 9.00 to 18.00 |
| No. 1 Bangor Ribbon | 6.75 to 7.00 | ..... | ..... | ..... | ..... |
| Pen Argyl | 6.50 to 7.25 | ..... | ..... | ..... | ..... |
| Peach Bottom | 10.50 to 12.50 | ..... | ..... | ..... | ..... |
| No. 1 Chapman | 6 25 to 7.25 | ..... | ..... | ..... | ..... |
| Vermont: | | | | | |
| No. 1 Sea Green | 4.25 to 6.75 | ..... | ..... | ..... | 27.00 |
| Unfading Green | 9.00 to 10.50 | ..... | ..... | ..... | 27.00 |
| Red | 12.00 to 20.00 | ..... | ..... | ..... | 30.00 |
| Maine: | | | | | |
| Brownsville, U'f'g Black, No. 1 | 12.00 | ..... | ..... | ..... | ..... |
| Slaters' felt, 30 lb. roll | 0.92 | ..... | ..... | ..... | 3.00 |
| Slaters' felt, 40 lb. roll | 1.22 | ..... | ..... | ..... | 3.25 |
| **STRUCTURAL STEEL** | | | | | |
| Beams and channel, 3 to 15 in., per lb. | 3.47 | 3.47 | 4.55 to 5.00 | 4.70 to 5.00 | 4.70 |
| Beams and channel, over 15 in., per lb. | 3.57 | 3.57 | 4.55 to 5.00 | ..... | 4.70 |
| Angles, 3 to 6 in. | 3.47 | 3.47 | 4.55 to 5.00 | 4.10 | 4.70 |
| Zees and tees | 3.57 | 3.47 to 3.52 | ..... | ..... | ..... |
| Steel bars, half extras, from mill | ..... | ..... | 4.90 | 4.00 | 4.25 |
| **STUCCO** | | | | | |
| In cloth, per ton (white, mixed) | 22.50 | 20.50 | ..... | ..... | ..... |
| **STUCCO BOARD** | | | | | |
| Medium weight stucco board, plain, per thousand sq. ft. | 42.50 | 65.00 | ..... | ..... | 60.00 |
| Medium weight stucco board, creosoted, per thousand sq. ft. | 50.00 | 70.00 | ..... | ..... | ..... |
| Heavy weight stucco board, plain, per thousand sq. ft. | 55.00 | 75.00 | ..... | ..... | ..... |
| Heavy weight stucco board, creosoted, per thousand sq. ft. | 60.00 | 80.00 | ..... | ..... | ..... |
| Medium weight stucco board, plain, narrow key, per thousand sq. ft. | 50.00 | 75.00 | ..... | ..... | ..... |
| Medium weight stucco board, narrow key, creosoted, per thousand sq. ft. | 55.00 | 70.00 | ..... | ..... | ..... |
| Insulating board, heavy felt background, per thousand sq. ft. | 50.00 | 70.00 | ..... | ..... | ..... |
| **SHEATHING BOARD** | | | | | |
| Heavy weight, sheathing board, per thousand sq. ft. | 50.00 | 70.00 | ..... | ..... | 65.00 |
| Medium weight sheathing board, per thousand sq. ft. | 46.00 | 63.00 | ..... | ..... | ..... |
| Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.). | | | | | |
| **WALL BOARD** | | | | | |
| Wall board, shipped any length, 4 ft. wide, per thousand | 45.00 | 50.00 | ..... | 46.00 | 53.00 |
| Packed flat in cars if ordered in less than car lots. Add $5.00 per thousand ft. for crating. | | | | | |